THE *Soybean Digest*

REG. U. S. PAT. OFF.

GEO. M. STRAYER, Editor KENT PELLETT, Managing Editor

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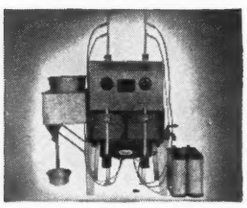

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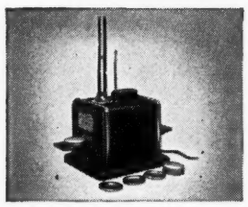

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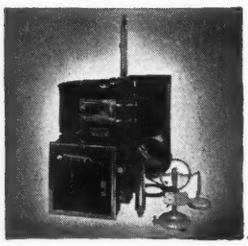

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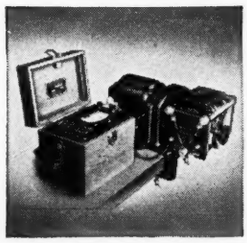

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EDITOR'S DESK

Back Rivers Bill If Amended H. R. 579, known as the Rivers Bill, has been in the hands of the committee on agriculture of the House of Representatives for over a year. As written, it would repeal the federal taxes on margarine, and the federal taxes on the manufacturers, wholesalers and retailers of margarine.

Repeatedly the American Soybean Association has adopted resolutions at its annual conventions endorsing the repeal of such taxes on margarine *produced from domestic fats and oils*. The war years, together with the Japanese annexation of Far Eastern supplies of tropical oils, have made it impossible for margarine manufacturers to use anything other than domestic fats in their product. Over 40 percent of the oil used in margarine in 1945 was soybean oil. Contrary to the previous contentions of many of them, their products have not suffered in quality. In reality many such products have been bettered.

It now appears that the Rivers Bill will be given consideration by the House agricultural committee at an early date. To that bill, as it now stands, the American Soybean Association is suggesting amendments which *would limit the repeal* of the taxes *to margarine produced from fats and oils produced within the continental United States.* Officers of the Association have conferred in Washington with members of the agricultural committee and with Soybean Belt congressmen. It is the contention of the American Soybean Association that farmers should cease taxing the oil from one of their most important crops — the second most important cash grain crop in the Midwest states — just to offer a subsidy to another crop which they themselves are producing. In most cases the bean producer is also the producer of the butterfat.

If H.R. 579 is so amended as to limit the repeal of the federal statutes to margarine produced from domestic fats and oils, then it offers the first opportunity in years for producers of soybeans to get behind a bill providing equality for their product and at the same time continuing present protection from cheap tropical oils originating outside this country.

In supporting its present position the American Soybean Association reiterates the stand it has taken over a period of years — that all domestic farm products should be allowed to find their own levels of consumption as based on their merits, without restrictive or prohibitive taxes or subsidies.

It's Full Production Once More in 1946 The uncertainty concerning the 1946 soybean price has at last been ended with Secretary of Agriculture Anderson's announcement February 25 that the present support of $2.04 will be continued.

The need for continued high production of soybeans is part of the general picture of world food shortages. President Truman has pointed out that world food supplies are at a lower ebb than they were in any wartime year and that more people face starvation today than at any time in recent history.

World oil supplies are not developing as earlier expected. This is probably the major factor which caused

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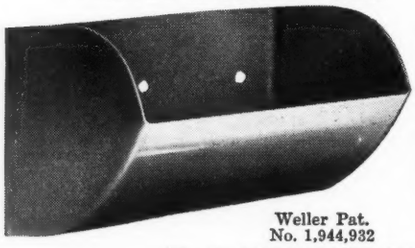

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the shift in Department thinking to larger acreages. Also it is certain that if we are to obtain a sufficient supply of protein to take care of livestock needs a year from now such supply must be grown by the soybean producers of the nation in 1946.

Farmers should plan where at all possible to plant a soybean acreage equal to that of 1945.

Continued high production of soybeans and other row crops as requested by USDA may delay the swing to sounder soil conserving practices since hay, pasture and oat acreages will have to be cut. Where possible, soybeans should be grown on the more level lands.

It would have been better if the announcement could have come sooner, but the overall situation demands fullest cooperation from producers in meeting the USDA's goal of 10.7 million soybean acres in 1946.

Just in Passing . . . County Agent L. E. Archbold, Adams County, Ind., believes Lincoln soybeans should command a higher market price than other varieties because of their higher oil content. He points out that the one-half pound per bushel higher oil yield of Lincoln makes it worth at least 6 cents more . . . Australian dairy farmers should meet competition of margarine by combining dairying with the growing of vegetable oils, suggests F. Wigan, Commonwealth supervisor of dairy exports. (Midwest dairy farmers adopted this plan years ago when they began growing soybeans.) In Wigan's opinion, margarine is here to stay and will command a larger and larger market.

You know what these are!

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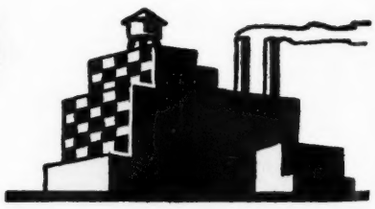
BUT *what is this?*



It's the new Purina Mills Soybean processing plant at Kansas City — the 5th in the chain of Purina plants spotted around the soy belt at St. Louis, Missouri; Circleville, Ohio; Lafayette, Indiana; Iowa Falls, Iowa; and, now, Kansas City, Missouri. Five stragetically located cash markets for soybean farmers.

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FUTURE FARMER WINS

Remington Bean Show

A 17-year old Future Farmer, Wayne Sommers, was the grand sweepstakes winner of the eighth annual Remington, Ind., Soybean Show in January.

Wayne, the president of the Remington Future Farmer chapter, won with a sample of Lincolns, rated as one of the best ever judged at the Remington show. Grown on a plot of ground in hog lot the year before, the crop had been fertilized with 100 pounds of 0-12-12.

The Remington show, one of the largest in the country, was the best ever this year, with 320 at the evening banquet.

Ward Calland, director of agronomic research for Central Soya Co., reported the results of his firm's survey of 1,602 soybean growers in north central Indiana. These results were published in the February *Soybean Digest.*

K. E. Beeson, Purdue University extension agronomist, said that Indiana soybean yield contestants had used row-planting almost exclusively in 1945 and that the Lincoln variety seemed to be less handicapped with wide rows than the shorter-stemmed Richland.

Dr. F. A. Frank of the Purdue agronomy department told the growers that extensive work was being done to determine why clover failures sometimes occur following soybeans, and indicated that too much seed bed preparation may cause such failure. (See article by O. H. Sears in September, 1945, *Soybean Digest* for a discussion of clover failure.)

Other cup winners included: Farmers division, Alma Collins, North Liberty, with Lincolns; certified growers, Chauncey Wood, North Liberty, with Lincolns; open, Bill Lee, Remington, all varieties class; junior agriculture, Wayne Lehman, Remington, all varieties; Benton County 4-H, Bill Maddox; and Jasper County 4-H, Marvin Alberts, Remington.

—s b d—

ONE THOUSAND AT VAN WERT SHOW

Despite rainy weather 1,100 people attended the seventh annual Van Wert County Soybean Roundup and Farmers Week held at Van Wert, Ohio, in February.

Lloyd Poling of Hoagland Township won the soybean trophy with a production of 32 bushels per acre. Gordon Rogers of Ridge Township, with 27.97 bushels, and Charles Poling of Pleasant Township, with 25.8 bushels, were medal winners.

The Roundup adopted a resolution favoring a support of not less than the present $2.04 price, and the raising of the price of soybean oil meal if necessary to reduce the soybean processing subsidy. "Since the price per pound of soybean protein is less than the price per pound of animal proteins, we would rather see the price of soybean meal advanced as a means of reducing the subsidy on soybean processing than to be forced to accept a lower price per bushel for soybeans," stated the resolution. "But, why does the subsidy on soybeans need to be reduced now when other subsidies are being carried forward? Why make a 'guinea pig'

(Continued on page 20)

Runnerups congratulate Wayne Sommer, winner of the grand championship in the soybean show at Remington, Ind. Left to right: Wayne Lehman, Marvin Alberts, Wayne Sommer, all of Jasper County; Chancey Wood, St. Joseph County; William Maddox, Benton County; and Bill Lee, Jasper Couny.

—Prairie Farmer.

CASE HISTORY No. 3

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Savings per 100 lbs. Paper over Fabric		.090
Saving per ton Paper over Fabric		1.80

DETAILS OF LABOR COST

	Production per hour	Cost Per 100 lbs.
100 lbs. Osnaburg		
8 men filling		
6 men weighing, closing, and handling	60,000 lbs.	.014
(average wage rate 60c per hour)		
100 lb. Paper (6 valve bag Packers)		
6 men filling		
6 men handling	120,000 lbs.	.006
(average wage rate 60c per hour)		

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A BRIGHT LIGHT AT A DARK MOMENT

Stone Mountain Grit Co., Lithonia, Ga., faced with heavy demand for grit to increase egg production, was bottle-necked by slow packaging and a severe shortage of osnaburg bags. With a packaging crew of 14 men, production averaged only 150 one hundred lb. bags per hour from each of 4 spouts — a total of 600 bags per hour. 6 St. Regis packers to fill multiwall paper bags were installed, and operated in pairs. With a crew of 12 instead of 14 men, production went up to 200 bags per hour per machine — a total of 1200 bags per hour . . . from 60,000 to 120,000 lbs. per hour.

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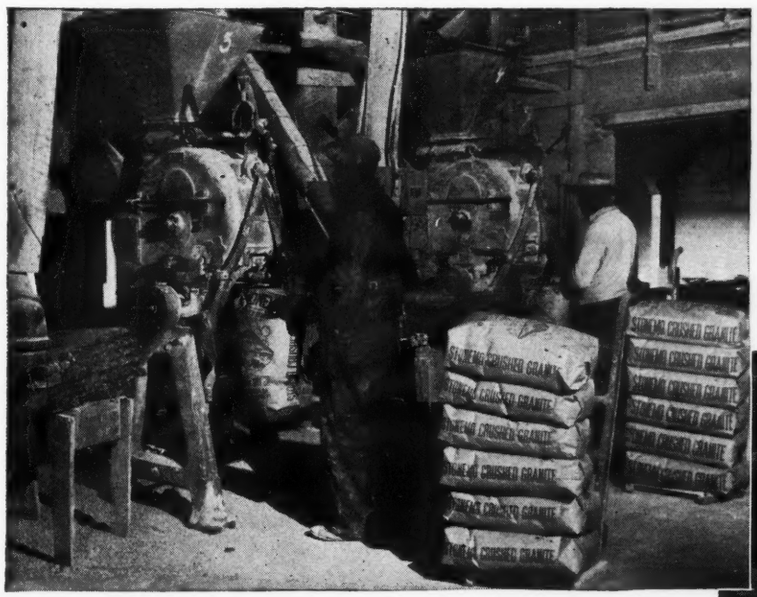

(Left) A pair of the St. Regis packers in the Stone Mountain Grit Co. plant at Lithonia, Ga.

(Below) Sift-proof Multiwall paper bags are handled easily.

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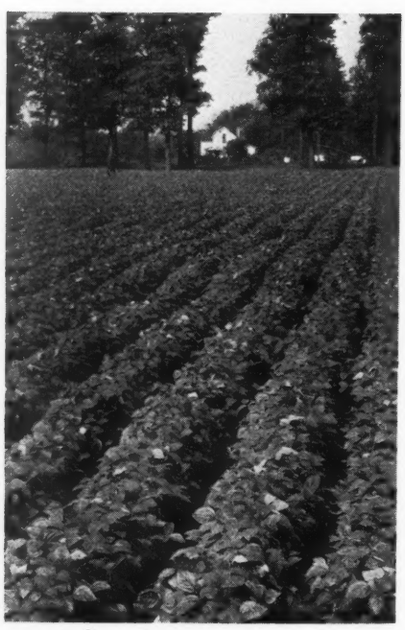
Cultural Practices In Illinois

Proper cultural operations control weeds in solid soybeans.

• *This is the second of three articles on cultural practice surveys by Mr. Calland. The first one covering the Indiana survey appeared in February. The Ohio survey will be treated in an early issue.*

Narrow rows gave definitely better yields than wide rows or solid seedings in this survey.



By J. W. CALLAND

Director of Agronomic Research
Central Soya Company, Inc.

MORE THAN 1,100 farmers in 10 north central Illinois counties* at the request of their farm advisers have told in detail how they grew 64,000 acres of soybeans on their farms in 1944. Summarizing their reports we can see just about how the crop is produced in these typical soybean counties which grow one-third of the Illinois soybean crop. Probably their practices are about the same as those used by the growers over much of the soybean area of the state.

An average soybean grower in these counties grew about 58 acres of beans in 1944 and got a yield of 25 bushels an acre. Forty-two percent planted them solid with a yield of 24.6 bushels while 58 percent planted in rows and got 25.3 bushels — .7 of a bushel extra. It was wetter in 1945, weeds were worse and the difference probably was more in favor of the rowed beans. Only one grower out of four plants solid in Livingston and Kankakee Counties but two out of three still plant solid in Vermillion and Macon.

Those planting solid used 1.6 bushels of seed on each acre while row planters used 1.1 bushels. The saving on high priced seed, better weed control, and earlier harvest are generally mentioned as reasons for the steady increase in row planting.

* Dewitt, Iroquois, Kankakee, Champaign, Livingston, Vermillion, Piatt, Macon, McLlean and Ford Counties.

Seventy-two of each hundred planting solid cultivated their beans after planting. The other 28 did not. The survey does not show what steps were taken to kill weeds before planting, but the growers who did no cultivating of solid beans harvested 1 bushel less beans per acre. The greatest gain in yield due to cultivation was 4.7 bushels an acre for McLlean County. Cultivation of solid beans gave increased yields in all counties except Macon and Ford where it appeared to reduce yields.

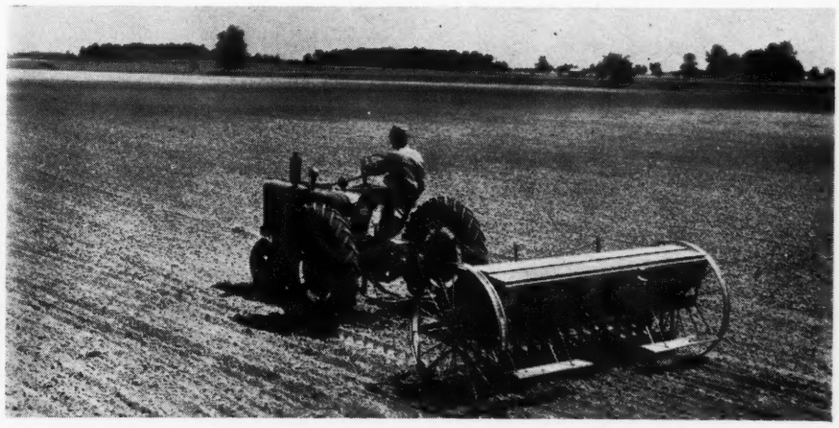
The rotary hoe was used for 68 percent of the cultivating done on solid beans, the spike-tooth harrow 30 percent and the weeder 2 percent. Forty-four out of each hundred growers cultivated but once, 43 cultivated twice and 13 cultivated three times.

Seventy-five of each 100 growers planting in rows used the corn planter, 16 the grain drill and nine used the beet and bean drill. An interesting comparison appears here. Beans planted with the corn planter had an average row width of 39 inches and a yield of 24.8 bushels; rows planted with the grain drill averaged 27 inches wide with a 26.7 bushels yield; while those planted with the beet and bean drill had an average row width of 24 inches and a yield of 27.4 bushels. It seems that this difference in yield per acre is due to row-width rather than to the implement used for planting row beans; since we get similar results by grouping the row-widths, regardless of implement used, into narrow, medium, and wide rows (See Table 1.)

TABLE 1. Comparative Yield of Row Soybeans (633 Growers).

Planter Used	Average Row-Width (Inches)	Ave. Yield Per Acre (Bushels)
Corn Planter	39	24.8
Grain Drill	27	26.7
Beet & Bean Drill	24	27.4
Row-Width Groups		
All wide rows	38 to 42	24.4
All medium rows	30 to 36	27.0
All narrow rows	18 to 28	26.6

The kind of soil planted to soybeans very definitely affected yields. Growers were asked to classify the soil type as dark, mixed, or light. Forty-nine of each hundred growers planted on dark soil with an average yield of 26.6 bushels, 46 classed the soil as mixed with a 23.8 bushels yield, and five said light soil and 19.6 bushels. This spread of 7 bushels per acre between dark and light soils was to be expected and it again points out that while soybeans may yield comparatively better than other farm crops on light soils they also respond well to improved fertility.



Approximately one-half of the soybeans grown in the Cornbelt are planted solid.

Seven percent of the row beans got one cultivation, 39 percent got two, and 54 percent got three. Only four growers reported cultivating the fourth time.

Only 419 growers stated whether they "furrow"-planted or "surface"-planted their row beans. Of these, 54 furrow-planted and 365 surface-planted. The furrow-planters harvested one-half bushel more beans per acre than the surface planters.

Illini was by far the favorite variety in 1944 as 70 percent of the growers planted it. Only 13 percent favored Richland and 5 percent Dunfield, which were the next varieties in order of popularity. The number of Lincoln growers increased greatly in 1945 when 39 percent of the growers reporting were growing at least a few acres of this popular new variety and 4 percent had planted some Earlyanas. It looks like 60 to 70 percent of all the soybeans produced in these 10 counties in 1946 will be Lincolns.

TABLE 2. Choice of Varieties and Variety Yields.

Variety	Number of Times Used	Percent of Growers Using	Average Yields (Bu.)
Illini	646	70	25.1
Richland	119	13	23.9
Dunfield	44	5	24.9
Mukden	22	2	23.8
Mandell	17	2	24.3
Chief	14	2	27.6
Manchu	12	1	20.2
Lincoln	30	3	27.0
Earlyana	12	1	23.4

NOTE: 5 grew Mt. Carmel, 1 Viking

Likewise soil preparation had something to do with yields. Eighty-three percent plowed their fields and took off one and one-half bushels more beans per acre than those who used only the disk.

Apparently the fields in these 10 counties now carry almost sufficient amounts of soybean inoculating bacteria. It is generally agreed that the cost of properly inoculating soybean seed is so small and the insurance value so high that it is only good business to inoculate. Moreover, the soybean is not able to add to the soil's nitrogen supply unless these bacteria are present in sufficient quantities. The growers quite generally follow this practice for 87 percent of them inoculated their soybeans, but the score was only one-tenth of a bushel in favor of inoculation.

Table 3 indicates that the soybean has a long planting season. It appears that, in 1944 at least, any time from the last week in April to the last week in June was okeh. Certainly weeds can be better controlled in solid beans if they are not planted too early.

The growers were asked whether they had ever planted soybeans on the contour, 22 percent failed to answer this question, but of the 774 who answered it only 55 said they had planted on the contour at one time or another. While it is true that most of the soybeans in these 10 counties are grown on fairly level land there still can be very little question about the advisability of more contour planting. Since it is a rather well proven fact that even on mildly rolling land contour planting of row crops such as corn and soybeans both increases yields and greatly reduces run off and soil loss.

TABLE 3. Yield Based on Various Planting Dates — 1944.

Planting Date	Number of Growers Planting	Percent Planted	Yield (Bu.)
April —	4	0.3	29.0
May —			
1st week	7	0.6	23.9
2nd week	32	3.0	23.6
3rd week	84	8.0	25.3
4th week	195	18.0	25.8
June —			
1st week	378	34.0	25.4
2nd week	258	24.0	23.9
3rd week	105	10.0	23.1
4th week	26	2.0	24.1
July —	1	—	17.0

The place of soybeans in the rotation is always a moot question. These growers were asked to name the crop which preceded the soybeans and also to name the crop which would follow the soybeans. Both the preceding and following crops are listed in Table 4. While this does not, of course, show the entire rotation scheme, it does indicate the place where soybeans occur in the rotation. Ninety-three percent of the 1944 crop was planted on corn or soybean land. Seventy-one percent would be followed by corn or soybeans and about 25 percent by oats.

The crop sequences given in Table 4 might indicate that a lot of growers are following a rotation of corn, soybeans, corn, soybeans. But it must be remembered that a great many Illinois farmers put soybeans between the first and second corn crops in their rotation. They say that this arrangement steps up the yield of the second corn crop which is followed by small grain and clover.

Only 7 percent of the farmers in these counties applied commercial fertilizer to the

(Continued on page 24)

TABLE 4. Preceding Crops.

Crop	Number of Times	Percent of Total
Corn	766	71
Corn, Soybeans	136	13
Corn, Oats	27	3
Corn, Clover	10	1
Soybeans	76	7
Oats	35	3
Clover, Hay	13	1
Others	14	1

Following Crops.

Crop	Number of Times	Percent of Total
Corn	480	45.0
Corn, Soybeans	88	8.0
Corn, Oats	155	15.0
Soybeans, Oats & Corn	20	2.0
Soybeans	85	8.0
Soybeans, Oats	23	2.0
Oats	159	15.0
Oats, Clover	16	2.0
Wheat	9	1.0
Clover, Hay	5	0.5
Others	23	2.0

The Flavor Quality of OIL FROM DAMAGED SOYBEANS

By J. H. SANDERS

Member of the Bleach Test Committee,
American Oil Chemists Society, Cincinnati, Ohio

AS A GENERAL rule fruit becomes less palatable as decay sets in. In this respect the soybean is no exception. While any decay in soybeans will undoubtedly have its maximum effect on products made directly from them, it has a definite and adverse effect also on the flavor quality of the expressed oil. In providing discounts in the price of beans that show a damaged (or decayed) condition, the government recognizes the reduced value—in quality or quantity—of products made from them. The object of this paper is to show how some of the various types of damaged beans affect the value of the expressed crude oil to the edible oil refiner.

WEATHER (OR FIELD) DAMAGED BEANS

Dry beans stored at normal or lower temperatures decay so slowly that they can be considered stable. On the other hand wet beans can decay so rapidly that the heat of decomposition ignites them, and thus starts a fire that may destroy the entire lot. Too much emphasis, therefore, cannot be placed on the need for keeping beans dry in storage.

High moisture content need not destroy the beans, nor induce discoloration, to prove costly. Hutchins[1] shows that beans with a moisture content above 12-13 percent must be dried to this level before milling, if oil of good quality is to be produced. Between the two extremes of wet but sound beans that need to be dried, and wet beans that decompose and burn, are the varying degrees of weather-damaged beans that are of major concern to the edible oil refiner. In an earlier paper the writer[2] has shown how crude oil from these various types of beans can be recognized, and classified with reasonable accuracy into flavor groups.

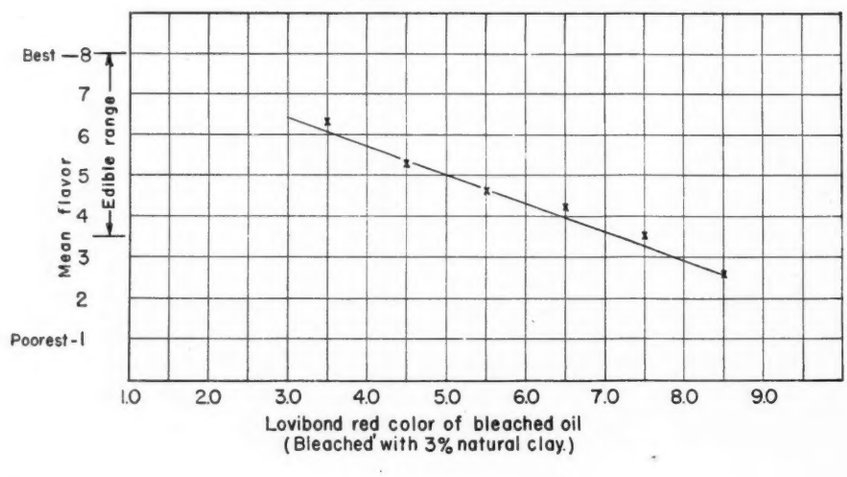
The refiner usually has no direct knowledge of the grade or blend of beans used in producing a delivery of crude oil. He must rely on the characteristics of the oil as a basis for predicting the final flavor quality of the processed fat. It is reasonable to expect darker colors in oil from discolored (highly-colored) beans, and to use this color variation as an index of flavor quality. Such variations in color behavior do, in fact, serve among refiners as a means of grading oils into flavor classes, and will likely form the basis for crude oil specifications in commercial trading. It is not the amount of color in the crude oil that is important; rather is it the type of coloring material present. Weather-damaged beans (or wet beans processed without preliminary drying) increase *red* color in the crude oil; and it will be seen that poor flavors increase with red color.

Neither the alkali refining of the crude oil, nor the standard earth bleach that follows refining, removes all of this red color. The amount that remains after these two purifying operations is a reasonably good measure of the flavor quality of a particular oil. Figure 1 shows this relationship in graphical form.

Whereas the "standard" bleach leaves varying amounts of coloring matter in the oil, in practice the refiner will vary the earth dosage to maintain uniformity of color in his products. This means that oils containing increased coloring matter, in addition to having poorer flavor quality, will also have a higher bleaching cost. The *increased* cost varies with the price of the oil, but usually ranges from five cents to fifteen cents per hundred pounds of oil—equivalent to ½c to 1½c per bushel of beans.

FIGURE - 1

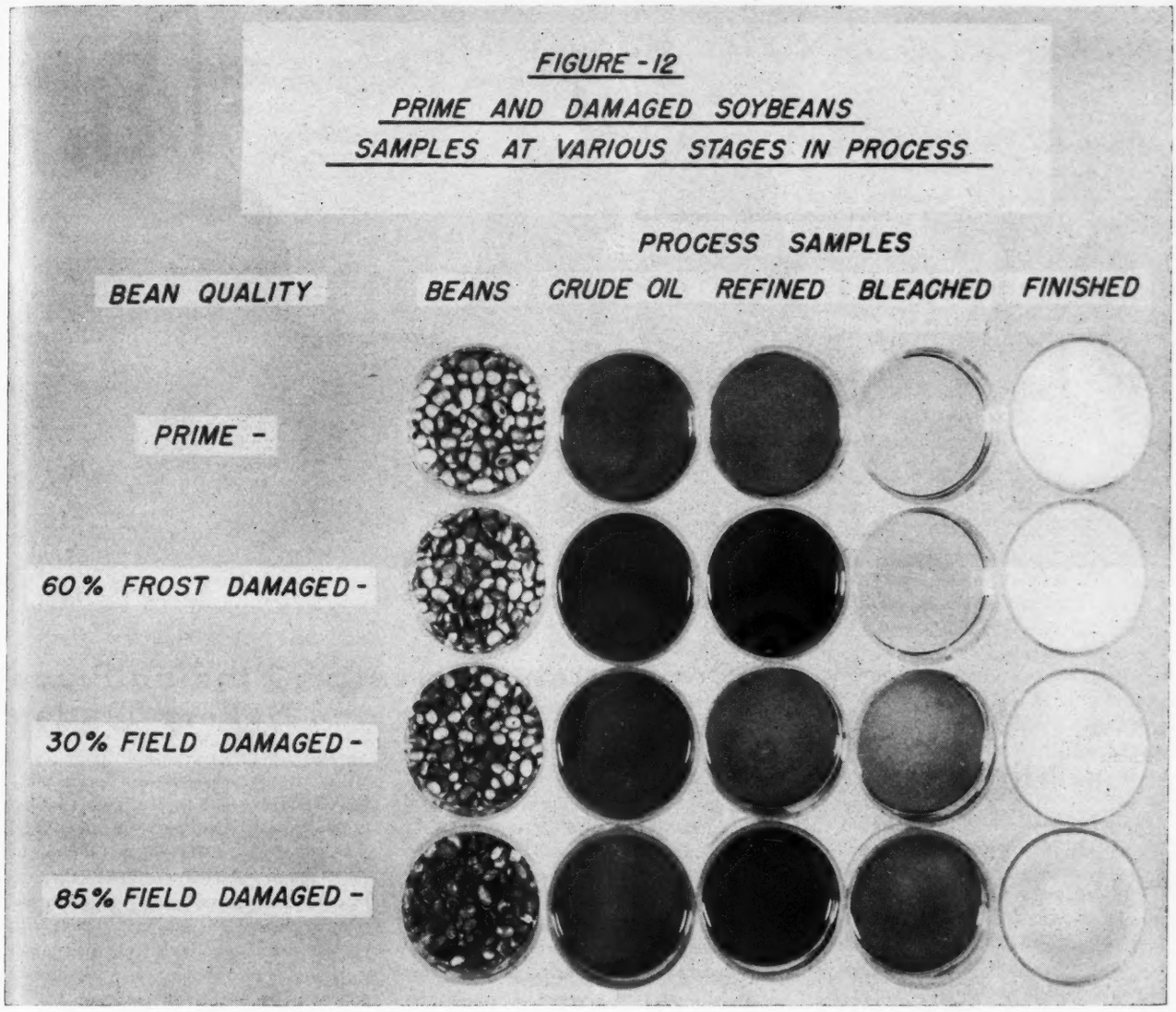
FLAVOR QUALITY OF SOYBEAN OIL
VS
LOVIBOND RED COLOR AFTER REFINING & BLEACHING



FROST-DAMAGED BEANS

One coloring material common to practically all plant life is chlorophyll, the green color of leaves. With the aid of light, it helps the plant convert carbon dioxide and moisture into carbohydrates. Its presence in the oil expressed from beans is unavoidable. In good grade oil from sound mature beans, the amount of chlorophyll present will be of the order of two parts per million. Such a small amount is insufficient to impart a green color to the oil, and is removed easily in the usual refinery operations.

In the fall of 1942, when an unusually early frost arrested the maturative process in the bean, unripe soybeans were delivered to the mills. These frost-damaged and literally green beans increased the normal chlorophyll content of the oil a hundredfold, enough to give the oil a decidedly green color. Even after the then standard refining and bleaching operations, there was enough chlorophyll left in the oil to give it a green appearance—too green to permit color evaluation on the usual Lovibond scale[3]. At first every oil of such intense color was presumed to be of poor flavor quality, but when this green



pigment was removed by an activated bleaching clay, which as a class is highly selective for chlorophyll, many of the oils were of acceptable quality.

The initially green oils that gave poor flavor after the chlorophyll had been removed, also contained considerable red pigment. This red pigment had been masked by the very green color of the crude oil, and did not manifest itself until the mask of green had been removed. It was concluded that the poor flavor quality was not a result of arresting the maturative process—i.e., from any damage by frost, or chlorophyll—but rather a result of the abuse received by the beans later on. Many of them were left in the fields under bad weather conditions—that is, many were weather-damaged, or as it is as frequently described, field-damaged. A qualitative comparison of frost-damaged and field-damaged beans, and the oil from them, is shown in the photograph of Figure 12, and some quantitative data on the same samples follow in Table 1.

The samples are listed in the order of their flavor quality.

The No. 2 yellow beans produce easily bleachable oil, of good quality. Beans that are frost-damaged only, will also produce fairly good oil. More bleaching earth is of course required to absorb the large amounts of chlorophyll, but if the chlorophyll-free oil is of light color, its quality will be reasonably good.

The third and fourth samples are from field damaged beans. The bleach colors are high with either type of earth bleach, and flavor quality is poor.

It is fortunate that the conditions having the greatest effect on oil quality are subject to some control by the growers. It has been the intelligent and diligent application of improved techniques of handling soybeans and soybean oil, during the past 10 years, that has made soybean oil fully acceptable to manufacturers of edible fats[4].

TABLE I.

	Lovibond Red Color After Bleach with 6% Natural Clay	Activated Earth Bleach		
		%* Used	Lovibond Red Color	Flavor Quality
No. 2 Yellow Beans	2.3	2.0	2.1	Good
60% Frost-damaged	Too green	4.0	3.0	Fair
30% Field-damaged	7.2	5.0	6.4	Barely edible
85% Field-damaged	14.8	12.0	8.2	Inedible

* To bleach oil substantially free of chlorophyll.

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(3) Freyer, E.—Evaluation of Color Quality of Crude Soybean Oil—Some Data and Difficulties Incident to Developing a Suitable Test for Off Grades—Oil and Soap, January 1944, page 13.

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Soy Albumen as a Whipping Agent

Harold G. Butler in Borden's new products laboratory.

Soy Protein Derivative Finding Place in Candy and Bakery Trades

By H. G. BUTLER
The Borden Company

LABORATORY research has been responsible for an unusual and interesting use of the soybean, in the form of a standard whipping agent for candy and bakery manufacturers. Developed as a wartime necessity it has assumed a place, which while not of major importance in terms of high volume sales or profits, is of definite value to these two industries, and an example of the versatility of the soybean.

The product, now known as Soyco, a soybean protein derivative, was developed after three and one-half years of laboratory research. It is a spray-dried, water soluble product processed from soybean oil meal. When first introduced to the candy and baking trades, it had — as all new products — certain "bugs" in it, but today, as a result of continued research and experimentation, it has gained the confidence of its users by proving its ability to do a good share of the job formerly done with egg albumen.

Only after a great deal of development work, including tests made with hundreds of batches of candy, was the basis for soy albumen prepared. But by early 1942, chemical controls had been chartered for production of soy albumen assuring uniformity and control of whip function, maintaining volume after whip, color and taste in candy batches.

An indication of the difficulties faced by laboratory researchers is seen in the problem of coagulation tests. While soy albumen has been found equal and even superior on the basis of whip ability to certain forms of egg albumen commonly used in candy making, the unrefined soybean product does not compare favorably in coagulation tests with egg which will give 100 percent coagulation if the drying process has been accomplished under careful temperature control.

Increasing the soy albumen coagulation factor is one important problem researchers are continually dealing with, to make it compare more favorably with the egg albumen coagulation factor. However, the solution of the problem will not be to make a laboratory duplicate of egg albumen but to provide a more versatile soy albumen.

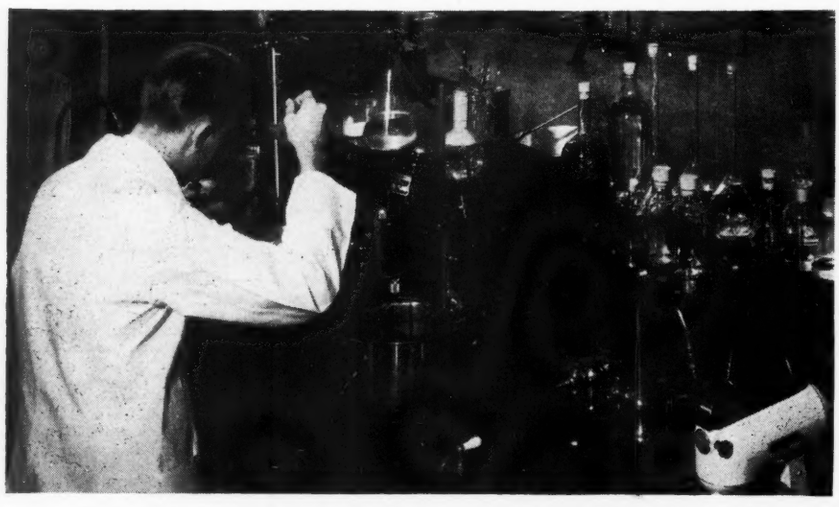
Laboratory men during the past few years have provided several improvements in the new product. The protein content has been increased to 75 percent. Color and taste have been refined. Moisture content has been decreased to a minimum. Whipping properties have been increased to the point where those of soy albumen compare equally pound for pound with those of egg.

These results from the laboratory have brought recognition throughout the candy and baking industries of the advantages of soy albumen for greater uniformity in manufacturing and in lower cost of production.

Generally the procedure of introducing soy albumen into a candy batch is no different from that followed for egg albumen. However, it has been found that certain changes in assembling a batch give better results.

The amount of soy protein derivative used

A corner of the Borden laboratories at 350 Madison Avenue, New York City.



in a candy batch depends upon the degree of coagulation required. In some candy types, such as a chewy nougat, egg albumen can be replaced entirely with soy albumen. For other types, where fluffiness and lightness are of greater importance, various proportions are used.

LONGER LIFE ON SHELF

Since soy albumen does not dry out as quickly as egg albumen, a longer shelf life is given to products made with it. A combination of seven parts of egg albumen to three parts of soy protein derivative gives whipped creams, hand rolls and light, fluffy nougats equal in quality to those made entirely with egg albumen. Soy whip also holds back the crystallization of sugar in cream centers and fudges, helping lengthen shelf life because the sirup of the cream is held in suspension a longer time. This factor allows a 10 to 15 percent cut in the amount of invert sugar used in a candy batch when soy whip is mixed with egg albumen.

For the baking industry, soy albumen led the way to a shorter and tenderer marshmallow for cookies when it was discovered the new product could be used with gelatin. However, at best it was also revealed that soy protein derivative is the product that most nearly approximates the results obtained from use of egg albumen in the same candy. It does this with considerable reduction in cost, compared with egg albumen, and with very little difference in technique or procedure.

Once manufacturers recognized soy albumen as a primary ingredient in its own right, its use was made easier. Tests showed that in low-boiled goods such as frappes, mazettas and nougat creams, soy albumen broke down little sooner than egg albumen.

The use of soy albumen resulted in a chewy nougat with a smooth texture that will not stick to the teeth. Consideration was also given to the smaller bubble structure developed by soy albumen, which in some instances was an advantage and in others an undesirable quality. Researchers merely could ask manufacturers to take these findings into account in preparing formulas for the best results.

Even a difference in physical manufacture of products with soy albumen was recommended. Best results were found to come when vertical, high-speed type beaters were used in production from formulas using soybean protein derivative.

While great steps forward have been made in the use of soy albumen because of the efforts of laboratory workers, it is still in its infancy. Many factors make it a difficult product for which to predict the attainment of major volume in sales and profits. Most important of these are the intricate processes of manufacture and standardization and the fact that egg albumen will always be the principle whipping agent.

Answers Attack on Soy

• From time to time there has been criticism of comments made in some publications with respect to the soybean's effect on the soil, and its place in the agricultural economy. Usually such comment has been based on lack of complete information. Recently D. J. Bunnell, chairman of the executive committee of the National Soybean Processors Association, pointed out the facts in a letter to the editor of WALL STREET JOURNAL. *His letter, of interest to all in the soybean industry, is printed here.*

January 28, 1946

TO THE EDITOR:

Criticism is no chronic affliction of mine for this is my first effort to correct a misleading statement of the press.

This correspondence has been delayed by an extended trip that consumed 2 weeks' time.

In your issue of January 8, in the Commodity Letter under "Soybean Acreage" it was stated: "Soybeans give land a terrific beating, upsetting the rotation of Cornbelt farmers."

I can understand how natural it is for a writer to favor the use of spectacular material as against material that would provide less reason to attract attention. However, the value of your publication, to the reader, is measured by the factual information incorporated through its pages. It probably is no presumption on my part to assume that you intend to adhere strictly to facts and avoid statements that are inaccurate.

If you, as a casual disinterested reader, were to see the statement just quoted in a well-regarded publication of national reputation, it would be natural to accept its authenticity in the same manner in which the paper and its organization are known. It is because I am among those who place your paper in high esteem that I feel obligated to correct this reference to soybeans for it is a statement without factual foundation.

ALL CROPS TAKE SOMETHING

All harvested crops take something away from the soil. The clovers and alfalfa draw heavily upon the soil for mineral plant food while performing their necessary function of nitrogen enrichment. Non-legume plants, such as corn, wheat, oats and other grain crops, deplete the soil of both nitrogen and mineral elements. The soybean, an annual legume, in its effect upon the land, stands between the soil improvement legumes (red clover, sweet clover and alfalfa) and the grain crops which take away from the soil all the food elements that sustain their growth. The soybean plant has the ability to supply itself from the air with that most critical and valuable of plant foods — nitrogen. When it is combine harvested with the straw, stubble and roots, and returned to the field, there is a positive addition of organic material — also some nitrogen — to the soil. The nitrogen addition is not large; but when this is compared to a 50 pound nitrogen loss per acre in a 50 bushel corn yield, or a 26 pound nitrogen loss in a 40 bushel oat yield and a 36 pound nitrogen loss per acre in a 25 bushel yield of wheat, it is an important factor. This nitrogen addition, when combined with the influence of the improved biological activity that the soybean plant stimulates in the soil, creates a positive wholesome result. Therefore, soybeans do not deplete the soil of nitrogen like the grain crops. Of all the nutrient elements needed for crop production, nitrogen is the most important and the most critical. It is also the most expensive to add to the soil in the form of fertilizer.

MUST SUPPLY MINERALS

No farm crop, either legume or non-legume, adds mineral elements such as phosphorus, potassium or calcium to the soil. These important plant food minerals must be supplied in manure, fertilizer and lime. The soybean, like other farm crops, draws on the soil for mineral nutrients. When the straw is left on the ground, soybeans rank about average with other crops raised in the Cornbelt from the standpoint of removing mineral nutrients from the soil. Of course, if the straw from small grains and the stalks from corn are not returned to the ground, there is a rapid depletion of mineral nutrients.

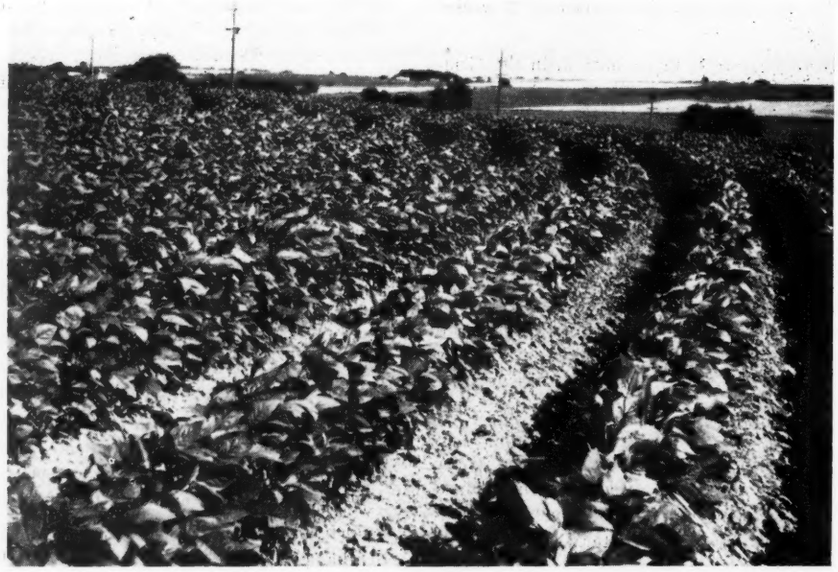
Ohio agronomists rank soybeans, when combined and the straw returned to the soil, as mildly soil depleting, giving them a numerical value of -½ in a scale where corn ranks -2, wheat -1, oats -1, and clover plus 2, which classes soybeans as one-half soil depleting as wheat and oats, but only one-fourth as soil depleting as corn.

The Iowa Experiment Station reports that corn yields 8.3 and 9.5 bushels more follow-

(Continued on page 24)

—U. S. Soil Conservation Service.

Serious erosion occurs on sloping land when soybeans are not planted on the contour and are not followed by a winter cover crop.



This fine field of soybeans drilled in contoured rows on a 4 percent slope will lose very little soil and will out yield similar fields planted up and down the hill.

SOYBEANS and SOIL EROSION

By E. D. WALKER
Associate Professor, Agronomy Extension
Dept. of Agronomy, University of Illinois

AS SOYBEANS have gained in importance in American agriculture, the effect of the crop on soil and soil erosion has come in for considerable discussion. Some soybean enthusiasts have ignored or minimized indications that soil erosion is stimulated by the crop. On the other hand, some men in the soil conservation field have tended to blame the soybean for many of our soil erosion problems, most of which were developing long before the soybean acreage became significant. In between these two viewpoints is a middle ground where soybeans can, with good management, be produced on erodible land without excessive soil loss.

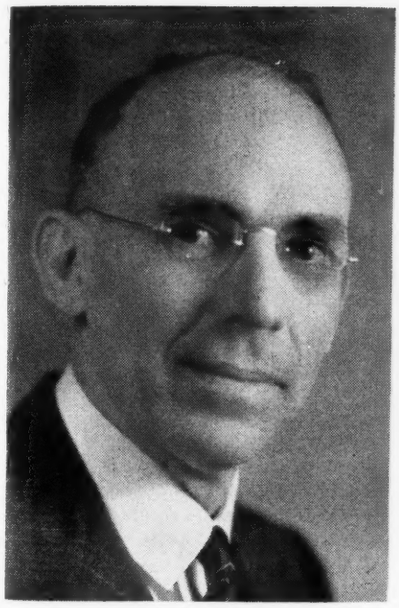
In considering the relation to soil erosion, two important facts must be kept in mind. In the first place, soybeans must be classed with the row crops which are always more conducive to erosion than either small grains or sod crops. This is especially true now that a large percent of the crop is actually produced in rows rather than being drilled solid. In either case, however, the soil must be worked to prepare a good seedbed; it must be cultivated to keep weeds in check, and during the first half of the crop season it receives little protection from the top growth of the soybean plants and is therefor subject to the beating action of the rain. All of these factors tend to induce erosion during the growing season. In the second place, soybeans have a definite tendency to improve the tilth of the soil. The year following the production of a soybean crop the land "works well" and is loose and friable. Other legumes have this effect but not to the same marked extent. Because the soybean land is loose, it erodes easily, thus increasing the erosion hazard, particularly during the late fall, the winter, and the early spring months of the following year. Many farmers feel that this is the most critical period for their soybean fields as far as erosion is concerned.

Much of our difficulty has been caused by the fact that although soybeans are in the row crop class, they have not been substituted for other row crops in the rotation. Cornbelt farmers, in many cases, have continued to grow as much or more corn, the usual row crop prior to the advent of soybeans, and have substituted soybeans for the small grain in the rotation. The elimination of the small grain crop left no place for the seeding of legumes and grasses and the rotation has, for the most part, degenerated to one of corn and soybeans. That one row crop following another definitely increases erosion is shown by results of the McCredie Soil Conservation Experiment Farm in Missouri. There, for the years 1940-1942 on a 3 percent slope of Putnam silt loam, soybeans following corn lost over three times as much soil as soybeans following meadow. Second year corn lost nearly twice as much soil as first year corn following a meadow crop.

To produce safely soybeans on sloping land requires care. The good management practices which should be followed in producing soybeans under these conditions should include:

1. Production of soybeans as far as possible on the level to gently sloping land on the farm. This is good practice with any of the row crops. If land steeper than about 2 percent slope must be used greater care must be exercised in the use of erosion control measures, as indicated below.

2. Production of soybeans in a rotation where a legume or legume-grass sod crop is grown on each field at least one year in four. To make the rotation most effective the fertility requirements of the soil must be taken care of by application of limestone, phosphate, or potash, as needed. Under these



E. D. WALKER

conditions, the sod crop will, by adding fresh nitrogen and organic matter and improving the soil structure, do much to prevent erosion during the time the field is in soybeans or other row crop. Fortunately, soybeans yield highest when grown in a soil management system which tends to improve the fertility level of the soil. In Illinois, they have responded much more to good soil management than to direct fertilization.

3. Use of special erosion control measures. The practice most generally applicable to land which might properly be planted to soybeans is that of contour planting and cultivation. In the Cornbelt states where definite tests have been run, contouring has resulted in a saving of soil and, in most cases, an increase in yield. At the Urbana field of the Illinois Agricultural Experiment Station contouring of corn on a 2 percent slope has reduced the soil loss over 40 percent. On the experiment farm at Bethany, Mo., contouring of small grain and corn for a 7-year period, 1936-1942, reduced the soil loss 52 percent. Similar results may be expected with soybeans. On the matter of yield, a check of the production of crops grown on the contour against those not grown on the contour on the same Illinois farms for the years 1939-1944 shows a yield difference in favor of contouring of 2.7 bushels of soybeans. Similar results are reported from Iowa.

In addition to contouring, grass waterways should be used wherever needed to take the surplus water off the field without the formation of gullies. If it is necessary to produce soybeans on steeper land (5 percent and above) simple contouring will probably not be sufficient to control soil loss. A longer rotation which includes an additional year or more of sod crop should be used along with contour strip cropping and terracing.

4. Use of crop residues for erosion control. Too many farmers follow the practice of raking and burning the soybean straw left after the crop is harvested. This results in material loss of nitrogen and organic matter, so badly needed to maintain fertility and soil structure. It also removes from sloping fields one of the best means of reducing soil loss. Tests have for several years been carried on by the Illinois Agricultural Experiment Station in cooperation with the Soil Conservation Service. Soybeans were grown on a 4 percent slope and at harvest time all residue was removed from one plot while on an adjoining one it was evenly distributed over the surface of the ground just as it would be following the combine. The following April from a single rain of 1.75 inches in one hour the bare plot lost 3,362 pounds of soil an acre and the covered one only 715 pounds or a little over a fifth as much.

To be most effective, the soybean straw should be evenly distributed over the soil. The straw spreader on the combine should be kept in good repair in order to accomplish this important result. Sloping fields planted and cultivated on the contour and with residues efficiently spread at harvest time should be well protected from erosion.

5. Sowing of cover crops to follow soybeans. One of the best means of preventing erosion on sloping land is to have a good growth of vegetation on such land as much of the time as possible. It is therefore desirable for a winter cover crop to be established on soybean land. For this purpose, winter wheat or rye can be used in all parts of the Cornbelt and winter barley in the southern portion. Oats may even be sown to grow up and freeze down for winter cover.

In establishing such a crop, the soil should be disturbed as little as possible. Some growers drill the winter grain in the stubble immediately behind the cutter bar of the combine without seedbed preparation. On the next round of the combine the straw is scattered over the seeded strip, thus adding the protection of the residues to that of the cover crop. If this is not possible a light discing followed by the drill does a satisfactory job. Since a good growth of the cover crop is essential, seeding should be made at the earliest possible date. A generous application of readily available phosphate fertilizer will aid in stimulating satisfactory growth of the cover crop.

In conclusion, it must be recognized that soybeans do tend to induce erosion and therefore present a hazard on sloping land. If, however, the above suggestions are followed the crop can be produced in moderation on at least our gentler slopes without danger of undue soil loss.

"SOYBEAN" BRIGGS OF WISCONSIN

A candid camera reveals George M. (Soybean) Briggs, University of Wisconsin agronomist, at his desk. Briggs was the subject of a recent feature story by a Milwaukee Journal writer who called him the U. of Wisconsin professor best known to the state's farmers. He acquired the nickname "Soybean" years ago by promoting soys as a forage crop. But, being a loyal son of a leading dairy state, he isn't always too pleased at the frequent sharp competition between soybean oil and butterfat.

Reprint From The Milwaukee Journal

Factors Affecting Soybean Yields

• *From a talk by R. R. Kalton, agent of the division of forage crops and diseases, Iowa Agricultural Experiment Station, before a Farm and Home Week audience at Ames in February. Recommendations are for Iowa.*

There are a number of important points that must be considered in order to obtain maximum yields of soybeans. Of course, the first essential is the selection of a good, recommended variety. Other significant factors affecting yields are date and rate of planting, inoculation, row width, cultivation, soil fertility, harvesting methods, and seedbed preparation. Each of these will be discussed briefly in the following sections in the light of the most recent information available.

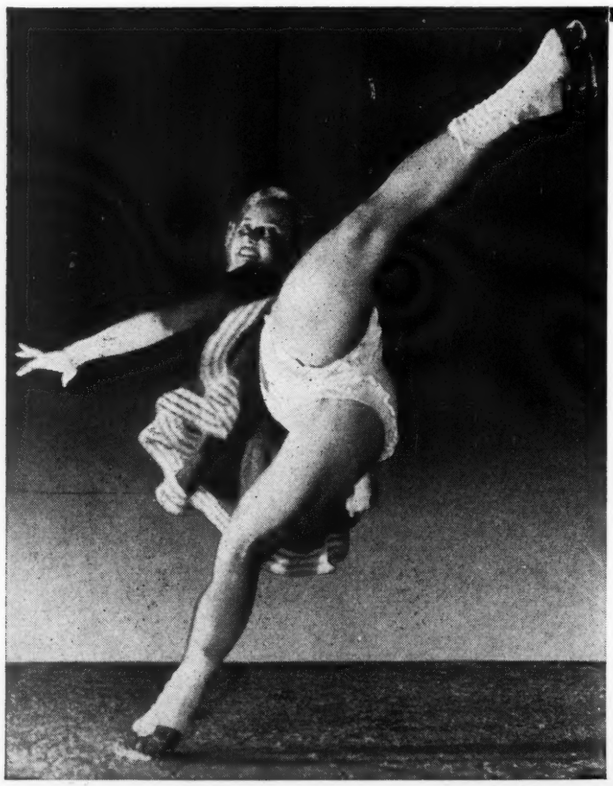
Date of planting studies just completed indicate that the best yields are obtained when planting is done early, May 15-25, if planting in rows. If beans are to be drilled solid, planting should be delayed until the last week in May to allow more time to kill weeds.

The correct rate of planting soybeans should give a thick enough stand to smother weeds in the row and still conserve on the seed supply. The best rate of planting for medium width rows (rows averaging 28-32" apart) is about one bushel per acre. Forty-five to 50 pounds of seed per acre are sufficient for wide rows (rows 40-42" apart). If drilling the beans solid, 2 bushels per acre are satisfactory. All of these rates are based on good seed with high germination and few cracked beans. Increased allowances must be made for poor germination and more than a few cracked seeds. As for inoculation, the best answer is to inoculate all seed planted with a good soybean inoculant. It is the cheapest insurance available for high yields.

Yield tests with different row widths have been carried out in several states in this area. The results show that medium width rows gave higher yields of grain than either wide-spaced or solid-planted rows. The spacing of rows should be as narrow as the tractor tread and cultivating equipment will permit. If narrowing the planter and cultivating equipment is not practical, the gauge marker on the planter may be shortened, giving alternate width rows of about 24-28 inches and 36-42 inches. This practice increases the number of rows in the field and helps increase yields. Removing the outside sweeps on the cultivator enables cultivation to go ahead as usual.

Weeds are by far the greatest menace to high soybean yields. Weed control should start even before planting with thorough surface tillage. Cultivation to kill weeds should be started as soon as the beans come through the ground. The rotary hoe, weeder, or harrow, all serve satisfactorily for early cultivation. They also can be used for breaking a soil crust before the beans come up. These implements should be used several times, if necessary, until the beans are 6-8 inches high. After the beans are 6-8 inches high, one to three row-cultivations generally give sufficient weed control. Sweep shovels do a good job and leave the field smoother for combining.

Soybeans, like corn, do respond to higher levels of soil fertility. However, little, if any, increase in yield has been obtained by direct applications of fertilizer to the soybean crop. Therefore, it is best to use fertilizers on other crops in the rotation, and keep up soybean yields by trying to keep all the



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R. R. Kalton addresses a Farm and Home Week audience at Iowa State College.

good land on the farm in a high state of fertility.

A well prepared seedbed is essential for a good soybean crop. When beans follow corn, either fall or early spring plowing is satisfactory. Several workings with the disk and harrow help to free the land of weeds before planting. In a dry spring, firming the soil with a cultipacker may prove beneficial to germination.

Practically all soybeans grown for seed are now harvested with a combine. Even though this method undoubtedly is the cheapest and easiest method of harvesting, it too may play a vital role in bringing about maximum yields. Improper adjustments, or combining at the wrong time, may cause considerable loss of beans through shattering, cracking, and poor threshing. Therefore, proper adjustments and combining at the right time are necessary to harvest the greatest possible yield of beans.

Although the factors in the preceeding paragraphs may not all seem of consequence in the attainment of maximum soybean yields, it is an established fact that the farmers in Iowa who have been getting yields of 25-35 bushels per acre the last few years have been following most of these recommended practices. Average soybean yields in Iowa during this same period have been between 18-20 bushels per acre. Good cultural practices do assist the farmer in realizing a greater return for his efforts.

—s b d—

GOOD YIELDS FROM NEW GEORGIA BEAN

Good yields are being obtained from the recently introduced Gatan soybean in Georgia, report R. P. Bledsoe and U. R. Core of the Georgia Experiment Station, where the variety originated from a natural cross with Otootan.

Gatan produces a tall viny hay-type plant similar to Otootan and matures a week later. The seed is reddish brown in color and small (about 5,000 to the pound), requiring about 15 to 20 pounds of seed to the acre when planted in rows. It has averaged 14.7 bushels per acre the past 10 years compared with 8.2 bushels for Otootan.

Main advantages of Gatan are high yields of seed and hay, the fact that it does not shatter easily, good quality of its hay, and small size of its seed which permits a low seeding rate.

The variety was first released to farmers in 1944 and some seed is now available.

—s b d—

LARGE ACREAGE IN ARKANSAS COUNTY

The soybean acreage in Mississippi County, Ark., has been on a rapid increase since C. G. Smith of Blytheville planted the first soybeans for oil in 1930, says Keith J. Bilbrey, Mississippi County agent.

Mississippi County produced more soybeans in 1945 than the entire state of Arkansas in 1937. Preliminary figures from the 1945 agricultural census show Mississippi County farmers planted a total of 70,348 acres of straight soybeans this past year. The acreage of beans interplanted with corn is thought to have been in excess of 75,000 acres.

The North Mississippi County Soybean Program Planning Committee recommends that all farmers replace their Arksoy beans with pure Ralsoys or Ogdens in 1946. Arksoy beans are no longer considered a pure variety by the state plant board, and it is believed that a shift to either Ralsoy or Ogden would increase the yield from 2 to 10 bushels per acre.

According to all reports received by County Agent Bilbrey, Ogden out-produced other varieties from 5 to 12 bushels per acre in 1945.

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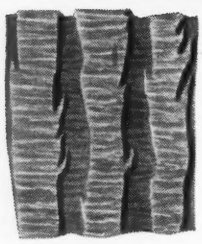

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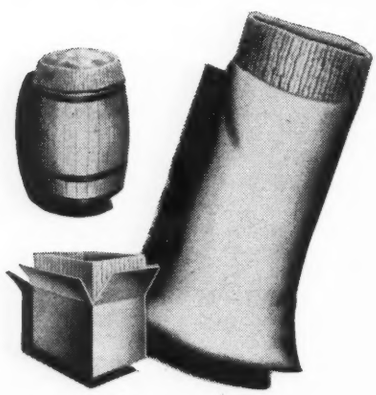

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—Missouri Ruralist.

Champion soybean growers in Audrain county, and the trophies they received at the recent crops and soils conference at Mexico. Grower with highest yield in county was Carver Brown, at center with loving cup. Other winners with their placques are Charles P. Davenport, left, and Roscoe Pfitzer.

AUDRAIN COUNTY, MO. SOYBEAN CONTEST

Champion soybean grower of Audrain County, Mo., last season was Carver Brown, of Laddonia. Audrain County is the leading soybean county of north Missouri, with total production exceeded only by southeast Missouri's Delta area.

Mr. Brown won his title in the county soybean contest, originated by the Alton railroad and co-sponsored in that county by the M. F. A. and Farm Bureau organizations. His yield was 17.3 bushels, far below the top of 36 bushels to the acre made in the 1944 contest. Wet weather, followed by dry months, cut yields in northeast Missouri.

On the top-yielding field Mr. Brown used 500 pounds of 20 percent phosphate in 1944. Of this 350 pounds were plowed under and 150 pounds applied in the row when corn was planted. In the spring of 1945 he plowed under another 250 pounds of fertilizer, and seeded the beans July 3.

Other winners in their classes of the contest were Charles P. Davenport, Centralia, and Roscoe Pfitzer, Mexico. Mr. Davenport had the top yield of 36.6 bushels in last year's contest.

—s b d—

GILL IS WINNER IN ILLINOIS CONTEST

Clement Gill, Speer, won the fifth annual Illinois 10-acre soybean growing contest with a field of Lincolns that scored 92.40 percent out of a possible 100, the Illinois Crop Improvement Association announced.

The average yield of all contestants was 34.62 bushels as compared with 38.18 in 1944. Fourteen of 17 high contestants grew Lincolns.

Gill's yield was 37.90 bushels per acre. His production cost for the 10 acres was $240.63, his quality grade 95 percent, and oil content 21.3 percent.

Elmer Learnard, Georgetown, who placed second, had a higher yield, 45.10 with a field of Lincolns, but his total score was 91.42 percent.

Jesse Riley, Maroa, was third with a score of 89.67 percent and a yield of 39.08 bushels. Lester Leigh, Sparland, was fourth with a score of 89.37 percent and a yield of 39.27. Leigh was first place winner in the 1944 contest.

Second on yield was H. L. Stiegelmaster, Normal, with 41.04 bushels.

Other high yields by sections were as follows: Section 2, Martin Manning, Ladd, Lincoln 37.69; Reid Bros., Smithshire, Lincoln 34.96; Howard Bacon, Roseville, Lincoln 34.85; Orville C. Robeson, Smithshire, Illini 26.52; H. C. Bradford, Ursa, Lincoln 30.92.

Section 3, L. P. Kerbaugh, Stanford, Lincoln 35.27; B. F. Templeton, Decatur, Lincoln 36.34.

Section 4, C. F. Davis, Sullivan, Lincoln 30.70; Fred E. Phillips, Arthur, Lincoln 32.00; Erhardt Wetzel, Atwood, Lincoln 29.49; E. H. Davis, Sullivan, Illini 27.96.

Section 5, Richard Ellis, St. Jacob, Chief 27.52.

—s b d—

VAN WERT

(Continued from page 8)

out of the soybean industry?"

D. G. Wing, Mechanicsburg, director of the American Soybean Association from Ohio, said there would be a considerable need for soybeans for many years to supply oil. He recommended row planting instead of broadcasting in order to keep down weeds, and urged earlier varieties and a better use of soybeans in the rotation.

R. S. Oetzel, manager of the Marsh Farm service department, was toastmaster at the annual dinner.

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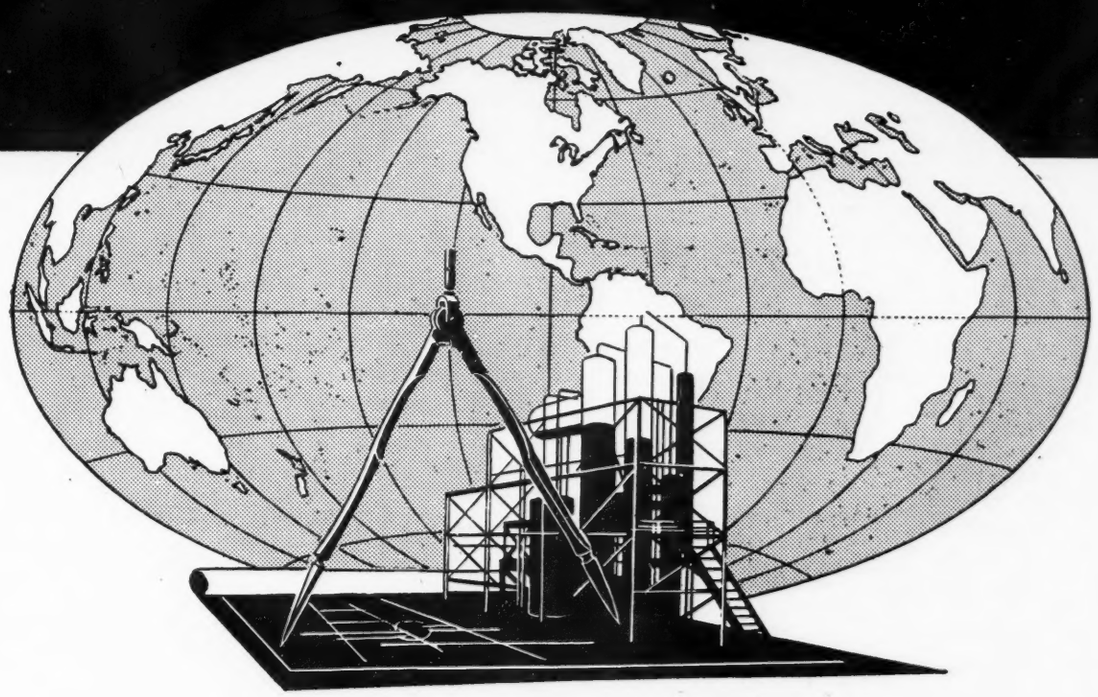

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ADAPTED VARIETIES

Much progress has been made recently in developing new soybean varieties of higher yield and oil content and otherwise superior to those previously in use.

This map which shows the adapted varieties for major soybean producing states, was compiled with the help of the state experiment stations, which furnished their latest recommendations on soybean varieties. Listed are the best, highest producing varieties which may be reasonably expected to mature before frost in each section. Hay varieties are not shown.

For more detailed information concerning varieties in your locality, and for states not shown on the map, contact your county agent or state experiment station.

SIX STEPS FOR FULL PRODUCTION IN 1946

1. Plant good seed of adapted varieties.
2. Thorough seedbed preparation to control weeds.
3. Inoculate with fresh live cultures.
4. Plant in rows, not too wide.
5. Grow on fertile soils.
6. Plant the more level fields to soybeans; contour on rolling land.

HERRICK SUCCEEDED BY HILBERT

Northern Lab Change

Horace T. Herrick left the directorship of the Northern Regional Research Laboratory at Peoria, Ill., to become special assistant on January 28 to Dr. O. E. May, chief of the Bureau of Agricultural and Industrial Chemistry, the U. S. Department of Agriculture announced. Mr. Herrick, who has directed the laboratory since 1942, was succeeded by Dr. G. E. Hilbert.

Dr. Hilbert's 15 years with the Department of Agriculture, five of which have been with the Northern laboratory, give him an intimate knowledge of agricultural problems, particularly in the North Central states which are served by the laboratory. He also has had extensive training and experience in chemistry.

Mr. Herrick's new position was created for the purpose of further encouraging the use of agricultural commodities in industry, and so that the Bureau chief might have a representative on his staff who could act as a liaison in keeping industry and agriculture in touch with the research accomplishments in the Bureau's various laboratories. It will be the duty of the new assistant to keep posted on the research under way in the Bureau, and as a result of his personal and continuous contact with industry to recommend the abandonment, change or acceleration of particular projects, and to assist in the translation of the Bureau's research into commercial use.

Mr. Herrick's 20 years of service in the Department and his 15 years of experience in industry before joining the Bureau of Chemistry in 1926 gave him the type of background needed in the new position. He was director of the Northern laboratory from 1942-46; assistant chief of the Bureau in charge of the four regional research laboratories from 1938-42; head of the industrial farm products research division from 1935-38, and of the color and farm waste division from 1926-35.

Mr. Herrick is the author of numerous articles on fermentation and the industrial utilization of farm commodities.

Dr. Hilbert has been head of the starch and dextrose division in the Northern laboratory since 1940 and has served as acting director of the Laboratory on numerous occasions during this period. Dr. Hilbert developed a method for the production of sirup and gluten from wheat flour, to help relieve the sugar shortage. More than 50 million pounds of glucose sirup are being produced annually from wheat by this method.

Dr. Hilbert is the author of a number of scientific papers and articles. He is a member of the Cosmos Club of Washington, the American Chemical Society, and other scientific organizations.

—s b d—

H. T. Herrick becomes special assistant to Dr. O. E. May in Bureau of Agricultural and Industrial Chemistry.

SOYBEAN HAY HELPS TO SUPPLY PROTEIN

Soybean hay may hold part of the answer to the dairyman's protein problem this year, says C. Y. Cannon, head of the Dairy Husbandry Department at Iowa State College.

Cannon points out that recent estimates show protein supplies will be at least 15 percent short of demand. This will place a burden on dairy farmers who are being asked to maintain milk production in 1946.

Soybean hay ranks close to alfalfa and clover as an ideal dairy roughage.

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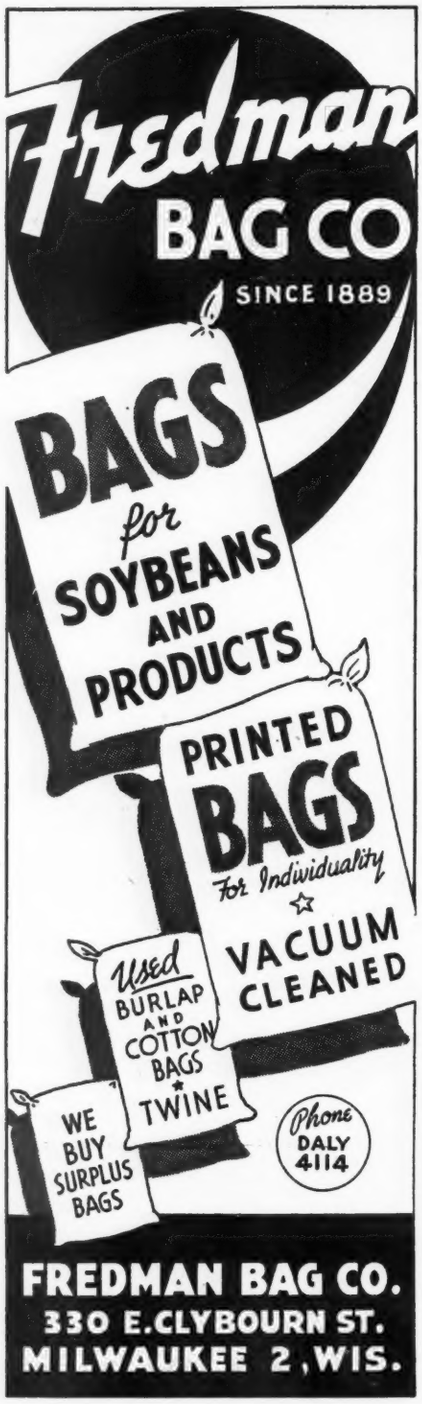


They Call It "PHOTOPERIODISM"

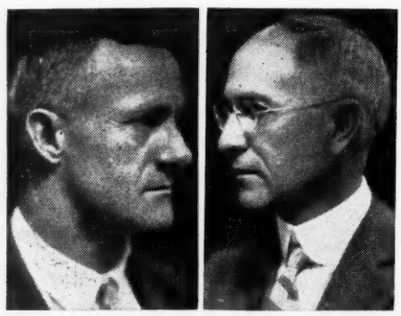
Radio talk by Gove Hambidge, coordinator of research publication, Agricultural Research Administration:

GOVE HAMBIDGE: On Wednesday, July 10, Nineteen Hundred and *Eighteen*, The Washington Evening Star carried the big heading: "ENEMY PREPARES TO HIT AMERICANS." It was a tense time in World War One. The German Armies were along the Marne. They were at Belleau Wood. They were at Chateau-Thierry, just 59 miles from Paris. And Ludendorf's great attack opening the Second Battle of the Marne was already in motion . . . ready to strike the next Monday.

It was a tense time.

On the same Wednesday, July 10, 1918, at 4 o'clock in the afternoon a scientist over at the Arlington Agricultural Experiment Station was doing a very curious thing. There, in a quiet spot between the Potomac River and Arlington Cemetery, he was putting some soybean plants and three tobacco plants into . . . what you might have thought was a rather small, dark chicken house.

Left—DR. W. W. GARNER, in charge of tobacco investigation, Bureau of Plant Industry. Right—H. A. ALLARD, physiologist, tobacco and plant nutrition, Bureau of Plant Industry.



He was just trying to see what would happen.

Actually, he also was making history.

A week and a day later, Marshal Foch gained the initiative . . . with an offensive that one historian describes as . . . the "first taste of victory after deep and bitter draughts of defeat."

And so did the scientists. (For there were two of them who together had planned this experiment.)

After a dozen years of many bitter disappointments they had at last gained the initiative. They had tasted success, and by the time the world was debating the Treaty of Versailles, their report also was receiving world-wide attention in scientific circles. When a famous German plant physiologist received that long scientific report describing this experiment, he sat up all night reading and studying it.

These two scientists — W. W. Garner and H. A. Allard—had discovered a fundamental law of nature. And you don't discover a fundamental law of nature every day.

When they put those plants in that crude dark chamber on July 10, 1918, they were trying to find the answers to two questions that had puzzled them for years. Why would soybeans planted at *different* times all bear seeds at the SAME time? And why would certain tobacco plant grow mammoth leaves in Maryland but not bloom and go to seed? Why did tobacco seed have to be produced by growing the plants in greenhouses in the winter?

After many years of trying everything else, Garner and Allard finally wondered what would happen if they made a summer day as short as the days when the soybeans always matured. And what would happen if the daylight for the tobacco plants were as brief as it is in winter?

So at 4 o'clock each day, they put the plants in the dark. And at 9 o'clock the

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next morning they took the plants out. These plants had a 7-hour day *in July*.

AND — THEY WENT TO SEED.

That was the answer. Scientists for the first time in history had begun to understand that day length makes a fundamental difference to many plants. Garner and Allard found a new law of Nature: Many plants can produce seed—and that means flowers and fruit—only when they have the right length of day.

Two years ago, and again this year, spring rains delayed the planting of some mighty important soybean crops — delayed it seriously. Could a crop be grown? Garner and Allard's discovery helped answer this question.

The answer was: Yes, try it. Farmers were advised to guard against weather damage in the fall, but to plant the soybeans. A delay of even 3 weeks in soybean planting would postpone the harvest only 1 week. It might be a poorer crop, but there *would* be beans, and we need all the soybeans we can get.

The secret back of that answer is: Soybeans are short-day plants. That is, they would bloom and mature when the days got short enough, even if they were planted late.

And so, in *many* ways, knowing about the day-length requirements of crops helps solve practical problems. Florists can stretch the day with electric lights in their greenhouses and produce flowers at the best time for *selling* them. Plant breeders can make new crosses by getting different species to flower at the same time. Plant explorers have a better understanding of what crops in a foreign country will do well in certain parts of our own country. Farmers have a new guide to help them choose crops and varieties suited to the regions where they live.

Garner and Allard called this newly discovered phenomenon . . . photoperiodism . . . which means reaction to a period of light. In the midst of a world war, they quietly made a fundamental discovery and opened up an entirely new field of research—a field of research that is still being explored. And with very interesting results. But that is another story.

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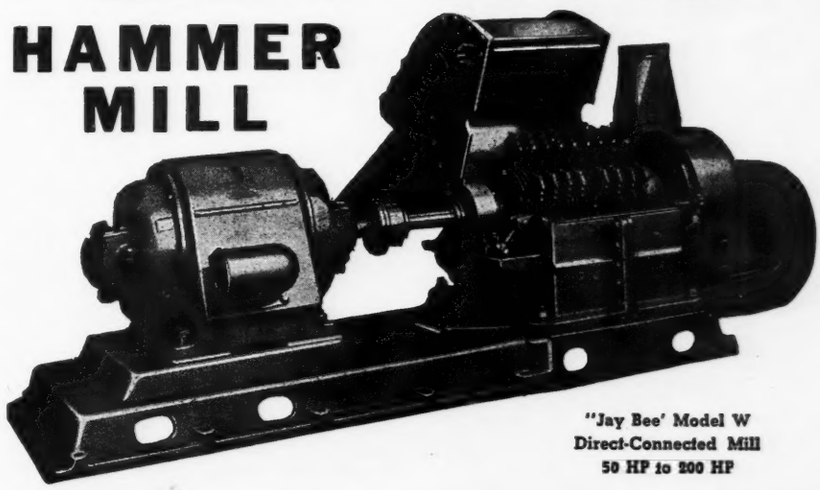

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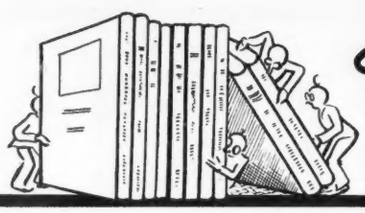
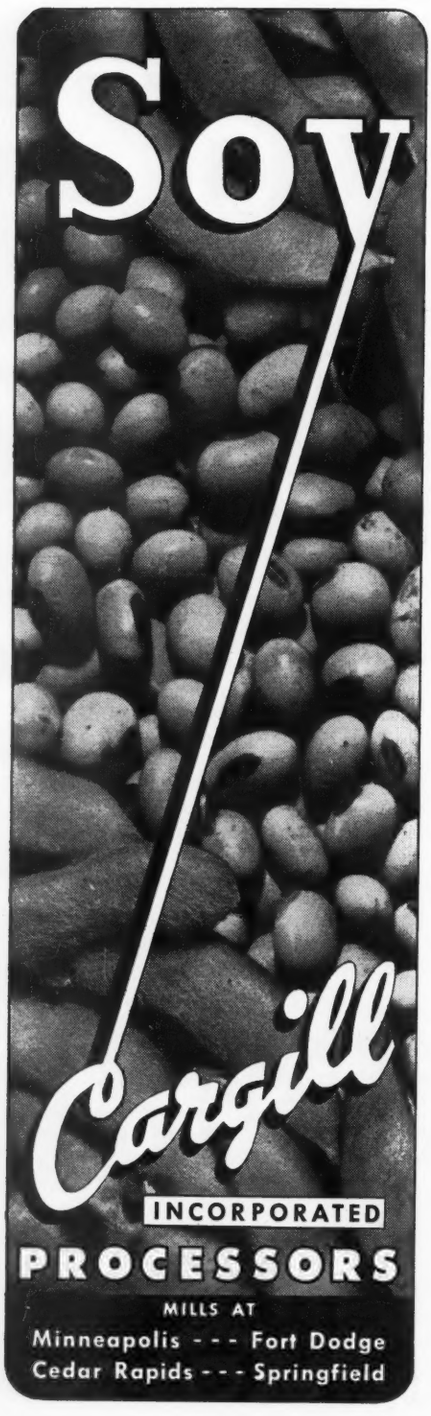


Publications

Food

CHEMICAL AND NUTRITIONAL STUDIES OF CANNED VEGETABLE SOYBEANS. By Amihud Kramer, C. H. Mahoney, Elizabeth Stephenson and Agnes L. Marks. Maryland Agricultural Experiment Station Bulletin A39, College Park, Md.



The canning of green vegetable soybeans is on the increase in this country. Although the nutritive value of the product is beyond question, there are wide differences of opinion concerning the table quality of various types of soybeans, which have received enthusiastic praise and equally wholehearted condemnation.

Tendency of the liquor to gel in the can is a factor which detracts from the product. Since the extent of variability among lots of this same commodity is being fully realized, the investigation reported by this bulletin was to determine factors which might significantly affect the nutritive values.

No outstanding differences were found among the varieties analyzed. The Emperor variety appears to be somewhat higher in protein, calcium and iron, and the Giant Green variety is somewhat lower in protein and higher in carbohydrates.

With the exception of thiamin and perhaps carotene, the indications are that canned soybeans may be held for as long as 3 years with no appreciable change in chemical composition.

When soybeans are harvested at the optimum stage of maturity for canning as a green vegetable, the canned product contains the highest quantities of protein, fat, ascorbic acid, and carotene. Beyond the optimum stage, increased maturity is associated with a decrease in protein, fat, calcium, phosphorus, iron, complete loss of ascorbic acid and carotene, no change in thiamin, and an increase in carbohydrates.

A shorter and higher temperature process seems to result in somewhat better preservation of thiamin and ash contents, but a greater loss of carbohydrates.

The gel-forming substance in the liquor of canned soybeans was found to be a gum, composed largely of pentoses, hexoses and uronic acids. Calcium or magnesium salts prevent gel formation, but in the quantities used in these studies they have a detrimental effect on flavor and texture of the canned product.

MODERATE VITAMIN C LOSS FROM VEGETABLE SOYBEANS. F. A. Lee and Joanne Whitcombe, New York State Experiment Station. *Journal American Dietetic Association*, 21: 696, 1945.

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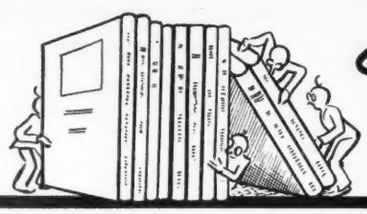
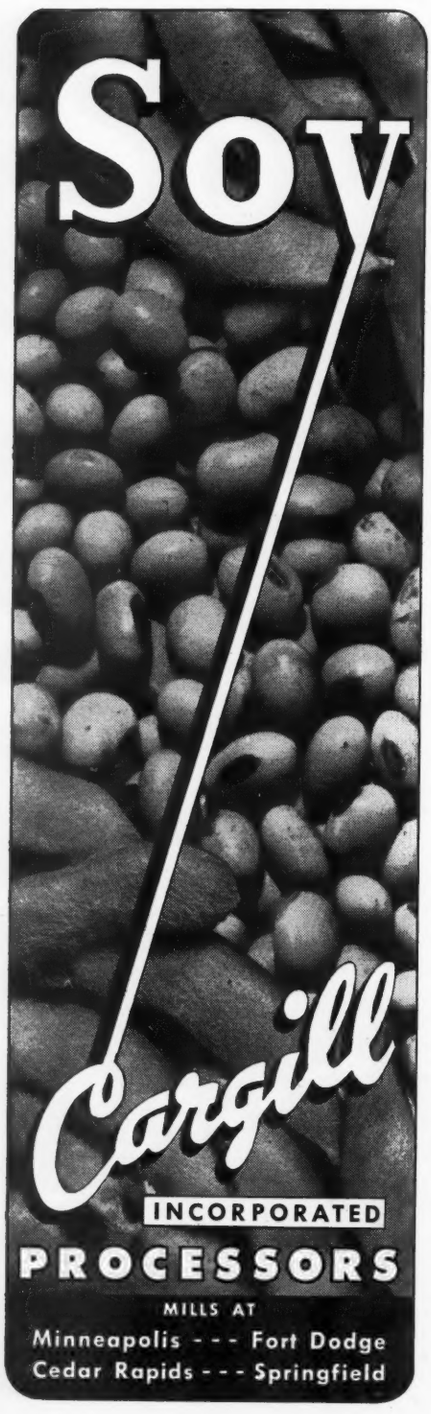


Publications

Food

CHEMICAL AND NUTRITIONAL STUDIES OF CANNED VEGETABLE SOYBEANS. By Amihud Kramer, C. H. Mahoney, Elizabeth Stephenson and Agnes L. Marks. Maryland Agricultural Experiment Station Bulletin A39, College Park, Md.



The canning of green vegetable soybeans is on the increase in this country. Although the nutritive value of the product is beyond question, there are wide differences of opinion concerning the table quality of various types of soybeans, which have received enthusiastic praise and equally wholehearted condemnation.

Tendency of the liquor to gel in the can is a factor which detracts from the product. Since the extent of variability among lots of this same commodity is being fully realized, the investigation reported by this bulletin was to determine factors which might significantly affect the nutritive values.

No outstanding differences were found among the varieties analyzed. The Emperor variety appears to be somewhat higher in protein, calcium and iron, and the Giant Green variety is somewhat lower in protein and higher in carbohydrates.

With the exception of thiamin and perhaps carotene, the indications are that canned soybeans may be held for as long as 3 years with no appreciable change in chemical composition.

When soybeans are harvested at the optimum stage of maturity for canning as a green vegetable, the canned product contains the highest quantities of protein, fat, ascorbic acid, and carotene. Beyond the optimum stage, increased maturity is associated with a decrease in protein, fat, calcium, phosphorus, iron, complete loss of ascorbic acid and carotene, no change in thiamin, and an increase in carbohydrates.

A shorter and higher temperature process seems to result in somewhat better preservation of thiamin and ash contents, but a greater loss of carbohydrates.

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OUR CIRCULATION MANAGER IS WED

A new name will henceforth greet our readers in communications from the *Digest's* circulation department. No, we do not have a new circulation manager.

Miss Virginia Currell, who has held that post efficiently for the past 2 years, became the bride of Dale Stull at the Presbyterian Church in Traer, Iowa, February 23. Mr. Stull is also engaged in circulation work, with *Wallaces' Farmer and Iowa Homestead.*

We are glad to announce that Mrs. Stull will continue to handle your subscriptions as they come in.

ILLINOIS SOYBEAN ACREAGE LISTED

The Illinois Crop Reporting Service has issued an Illinois farm acreage census, listing by counties the acreage devoted to various crops, including soybeans, in 1944.

The east section, including Champaign, Ford, Iroquois, Kankakee, Livingston, Piatt and Vermillion counties, still continues to be probably the most intensive area of soybean production in the nation, with 728,263 of its 3,444,203 farm acres in soybeans. Champaign is the leading county. Vermillion is second.

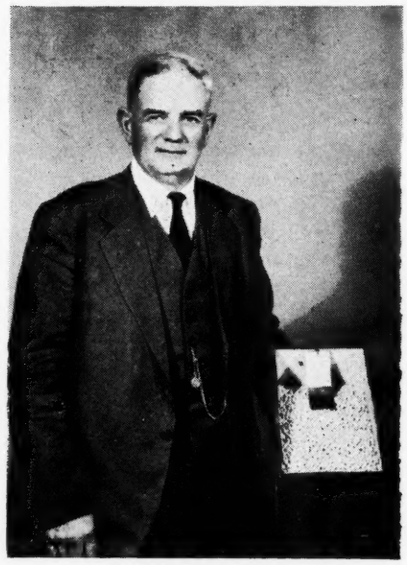
—s b d—

IOWA PRODUCERS ARE STRONG FOR LINCOLN

Lincolns outyielded other varieties in the southern two-thirds of Iowa by an average of 5.5 bushels an acre in 1944, according to 54 growers who responded to a survey. This is reported by *Farm Science Reporter.*

Average yield of the Lincoln soybeans was 31.4 bushels an acre as reported by the Iowa farmers who tried out Lincolns in 1944.

WINS PILLSBURY AWARD



C. E. Canterbury, Cantrall (Sangamon County), was the 1946 winner of the Pillsbury soybean award in Illinois, with Lincolns. The award was made during annual Farm and Home Week at Urbana.

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CHECK THE EQUIPMENT YOU NEED AND WRITE FOR KELLY-DUPLEX SPECIFICATIONS

- ☐ FEED MIXERS
- ☐ HAMMERMILLS
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- ☐ FEED REGULATORS
- ☐ SHELLERS
- ☐ ASPIRATORS
- ☐ SCALPERS
- ☐ CHAIN DRAGS
- ☐ ATTRITION MILL BLOWERS
- ☐ BAG CLEANERS
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- ☐ ELEVATOR BOOTS
- ☐ BUCKETS
- ☐ SCREW CONVEYOR
- ☐ SPOUTS

THE LINE WITH 60 YEARS EXPERIENCE TO BACK IT

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Springfield, Ohio

always something new

It's been a basic PK policy for 60 years to look ahead in your interest . . . to provide for you *"always something new"* in sales-building bag ideas, printing methods, and materials.

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New Ingredients

FOR QUALITY BAKED GOODS — MEAT PRODUCTS — DOG FOODS

Glidden's Research and Technical Skill have developed many new products and processes using the Soybean for the Baking Trade, the Meat Industry and Dog Foods.

SOYALOSE GRITS

Low-fat Soy Grits . . . 7% Vegetable Oil . . . Rich in Protein . . . Manufactured in three granulations:
No. 140 Fine No. 40 Medium No. 16 Coarse

SOYABITS

A practically fat-free product . . . Contains over 51% Protein . . . Processed by the Extraction Method . . . Manufactured in three granulations:
No. 120 Fine No. 40 Medium No. 24 Coarse

SOYARICH

A full-fat Soy Flour . . . 20-22% Vegetable Oil . . . Rich in Protein.

SOYAFLUFF

A defatted Soy Flour . . . Over 50% Protein . . . 1% Vegetable Oil.

SORBO

An all-cereal binder especially prepared for Meat Loaf Production.

A complete set of free samples are available for your selection, in order that you may choose the type correctly adapted to your particular products and formulas.

THE GLIDDEN COMPANY

SOYA PRODUCTS DIVISION

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Superior Legume Inoculator

for your

Soy Beans

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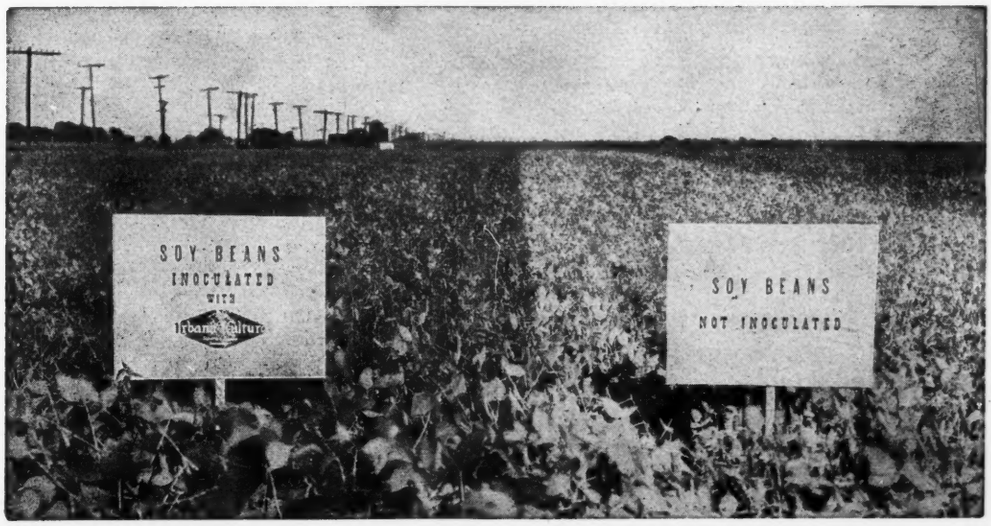

Inoculate with Urbana Culture and Efficiently Utilize the Free Nitrogen of the Air

Prepared only by **THE URBANA LABORATORIES** **Urbana, Illinois**

GRITS and FLAKES... FROM THE WORLD OF SOY

An interesting recent article in *Bakers' Helper* by Joseph A. Lambeth, gives information on use of soy flour by the commercial baker. The article, entitled "Streamlined Flour Production of Today's Miller," includes formulas for white and yellow layer cakes using soy flour. "A new era has arisen in the production activities of the baker, the era of soy flour," says Author Lambeth.

* * * *

Woodson K. Woods, Jr., formerly associated with the cereal department of Ralston Purina Co., will join Chase Bag Co., May 1. He will serve in an executive capacity with P. S. Forthman, manager of the St. Louis branch of the Chase firm.

* * * *

U. S. Department of Agriculture's office of Foreign Agricultural Relations has issued a handbook, "Agricultural Geography of the Philippine Islands," which provides information on the Philippines as a geographic and economic area. It may be obtained from the Office of Information, U. S. Department of Agriculture, Washington, D. C.

* * * *

"Flavor Reversion in Edible Fats," is an article by A. E. Bailey of the Southern Regional Research Laboratory in the February issue of OIL & SOAP.

* * * *

A new booklet on the care of paper bags, "Important Facts for the Man in Charge of Paper Bag Storage," has been issued by Bemis Bro. Bag Co.

* * * *

To transform the knowledge of chemicals gained during wartime into products of increased quality for industrial and civilian use, more than 2 million dollars will be spent to expand the facilities of the Naugatuck chemical division of the United States Rubber Co., at Naugatuck, Conn., it is announced. The expansion program includes the construction of eight new buildings, all to be in operation before the end of 1946.

* * * *

Details of the method for quantitatively determining soybean oil in admixture with cottonseed or peanut oil have been announced by chemists of the Southern Regional Research Laboratory. It is based on the presence of linolenic acid in soya oil and the absence of this or any other triple-bonded compound in either of the other oils.

* * * *

Preston Soya Co., Preston, Minn., has been purchased by Hubbard Milling Co., Mankato, from Fred Kaup. The plant superintendent, Bernard Malowald, continues.

* * * *

Loren F. Davis, formerly of Swift & Co.'s Chicago general office, was recently placed in charge of the sales and traffic at the firm's soybean mill in Des Moines, succeeding E. L. Dutcher. He began work with Swift & Co. in 1930.

* * * *

Fred Johnson, president of Marshall Mills, Inc., has announced that a $60,000 soybean processing plant will be erected in Marshalltown, Iowa, construction to be started as soon as weather permits.

* * * *

George H. Keyser has been appointed superintendent of the technical oil refineries at the Belmond plant, according to announcement by Whitney H. Eastman, president of the chemical division of General Mills. Keyser will also continue his duties as chief chemist at the Belmond plant for the present. Eastman has also announced the appointment of Roy W. Bryant as traffic manager at the Belmond plant.

* * * *

Construction and application of equipment are covered in the new booklet, "Prater Dual Screen Pulverizers," issued by the Prater Pulverizer Co., Chicago.

* * * *

Appointment of Charles H. Bell, Minneapolis, as head of the new office of research-production coordinator for General Mills has been announced by Whitney H. Eastman. The office has been created to expedite the transition of the products of research into commercial operation.

* * * *

The Swift & Co. Oil Mill, Blytheville, Ark., are expanding their operations and are erecting several new steel storage soybean tanks, increasing their capacity several hundred thousand bushels, according to Lindsey Gunn, manager.

GLIDDEN EXECUTIVE WAS TWICE HONORED

R. W. Levenhagen (left), senior vice president, and Adrian D. Joyce, president and chairman of the board of the Glidden. Co.

Twice in his remarkable career R. W. Levenhagen, senior vice president of the Glidden Co., has been honored for 25 years of service to his company.

Mr. Levenhagen was presented with a gold watch by the Glidden Co. in February in honor of his first quarter-century as vice president of the Cleveland concern. He had been similarly recognized 26 years ago by the Sherwin-Williams Co.

The executive, now 65 years old, began his career in his teens as an office boy for the latter company. When presented with his first watch, he was secretary of the company and assistant to the president.

He joined the Glidden Co. in 1921 as vice president in charge of its paint and varnish division.

During most of Mr. Levenhagen's career with Glidden, however, he has directed the Durkee Famous Foods Division, a wholly-owned subsidiary. His success may be measured in this division's enormous annual volume of business.

Adrian D. Joyce, president and chairman of the board of the Glidden Co., presented the watch and certificate of long service to Mr. Levenhagen, who is still actively engaged in his work and at his desk every day.

Other associates of Mr. Levenhagen present at the ceremonies honoring him included: R. H. Horsburgh, executive vice president; Dwight P. Joyce, vice president; Clifton M. Kolb, secretary; John A. Peters, treasurer; Alexander D. Duncan, general manager of the paint and varnish division; Nestor Betzold, sales manager of the food package products division, and John Stadter, general purchasing agent.

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Get the facts for consideration with *your* situation. See if this Anderson equipment is *your* answer to climbing costs. Write today for complete details and recommendations.

The V. D. ANDERSON Co.

1935 West 96th Street • Cleveland 2, Ohio

The Swift & Co. Oil Mill, Cairo, Ill., have completed the erection of eight new soybean steel storage tanks of about a capacity of 60,000 bushels each. A. S. McGinnis, superintendent is in charge of processing.

* * * *

Arkansas Mills, West Memphis, Ark., have completed the expansion to increase their soybean plant to 60 tons per day capacity by installing a new expeller, making this plant a seven expeller plant, according to R. N. Archer, manager. They have also erected 16 new concrete storage tanks which will give them a total storage of about 350,000 bushels.

* * * *

Friends will be pleased to learn that Jacob Hartz, Sr., American Soybean Association director from Arkansas, is recovering nicely from a recent illness. Mr. Hartz' load in the Jacob Hartz Seed Co., at Stuttgart will be lightened considerably by the return from service this month of his two sons, Jacob, Jr., and Marion.

* * * *

Prater Pulverizer Co., builders of processor equipment, announce the Prater certified permanent magnet for the removal of tramp iron from material. A new folder describing the equipment may be had by writing the firm at 1825 S. 55th Ave., Chicago 50.

* * * *

Construction will be started this Spring on a new soybean and cottonseed crushing plant at Ridgely, Tenn. Wynn Smith of Tiptonville, Tenn., has been named manager.

* * * *

Dr. Lewis W. Erdman, for 17 years with the Nitragin Co., Milwaukee, Wis., left that firm March 1 to take up new duties as bacteriologist with the Agricultural Research Administration, Bureau of Plant Industry, at Beltsville, Md. He will do research work with legume bacteria.

* * * *

Chase Bag Co. has sold its large factory building at 700 Washington Ave. N., Minneapolis, to the Gamble-Skogmo Co. F. H. Ludington, president of the Chase Co., announces that the firm will erect a new modern bag plant on Washington Ave. N. at 38th St., bordering on the Mississippi River. The new building will contain approximately 160,000 square feet of floor space.

OLSON IS LINK-BELT MANAGER AT K. C.

Arthur J. Olson, heretofore district sales engineer for Link-Belt Co. at Chicago, has been appointed district sales manager at Kansas City, Mo., to succeed Max Giffey, who has resigned after 40 years' service with the company.

Olson has been in the employ of Link-Belt Co. since 1918, at the Pershing Road plant in Chicago.

For the past 20 years, he has specialized on equipment for the meat packing and allied industries, handling the engineering and sales of elevating, conveying, materials handling and power transmission machinery.

—sbd—

CAR SHORTAGE

An abnormal demand for grain cars rather than a deficiency in the railways' car pool is responsible for the existing "car shortage," Z. G. Hopkins, public relations representative of the western railways, declared in an address before the Farmers' Grain Dealers Association of Indiana, at Marion, Ind., March 4.

SWAP U. S. SOY OIL FOR GRECIAN OLIVE OIL

The U. S. Department of Agriculture has announced that 3,000 metric tons of soybean oil (a metric ton is 2,204.6 pounds) will be allocated for export to Greece as a result of assurances received from the Greek government that export permits will be granted for an equal quantity of olive oil for importation into the United States.

An emergency allocation of 1,500 tons of soybean oil is being made for the January-March quarter with the balance of 1,500 tons to be allocated for the April-June quarter. The Department of Commerce is being notified of the allocation for the January-March quarter. Applications by private exporters for export licenses for the shipment of soybean oil to Greece should be sent to the Office of International Trade, Department of Commerce, Washington 25, D. C.

In addition to the export licenses issued by the Department of Commerce, the exporter will be required to obtain a certificate of subsidy clearance from the Department of Agriculture. Such certificates will be issued by the Commodity Credit Corporation's office in New York City upon payment of a refund of the domestic subsidy of 3¾ cents a pound of crude oil or 4 cents a pound of refined oil.

Additional details will be contained in a forthcoming issue of the current export bulletin of the Department of Commerce.

It is understood that the Greek government will issue export permits to normal olive oil exporters and prices will be such as to permit importation into the United States within the price ceilings established by the Office of Price Administration.

The Department of Agriculture stated that it would be prepared to consider authorizing the exportation of a limited additional quantity of soybean oil to other countries in exchange for assurances from such countries that they would grant export permits for the importation into the United States of equal quantities of olive oil.

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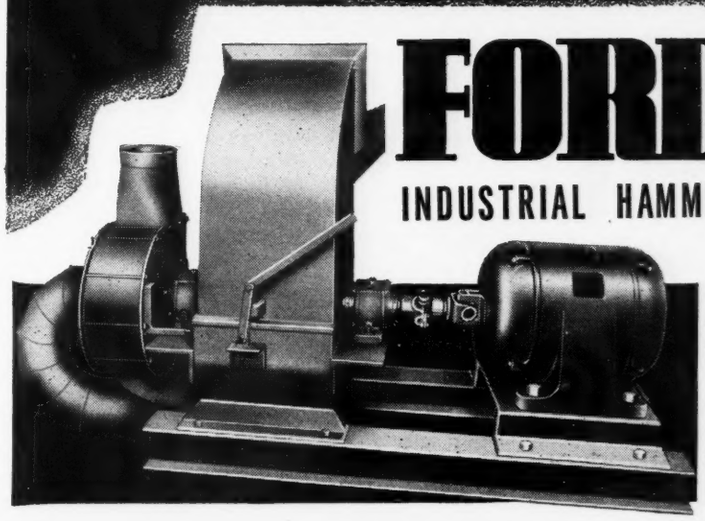
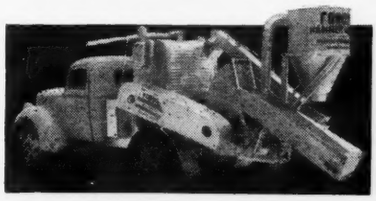
INDUSTRIAL HAMMERMILL



40 to 150 H.P. Cap.

All Steel, Welded

YOU'LL see a big jump in your grinding profits when you install a FORDS. In recent tests supervised by an electric power company, FORDS Hammermills used less than **half** as much electric current per cwt. of grinding as other well-known hammermills tested. Many users report the FORDS pays for itself with the power it saves. Here are the reasons:



FORDS PORTABLE HAMMERMILL

FORDS' all steel welded construction reduces the weight, yet is stronger. And FORDS' hammer speed is the most efficient for volume grinding — another big saving in current. Also, the FORDS is balanced for smooth operation—reduces power-wasting vibration and breakage.

You'll welcome the extra grinding profits a FORDS can earn for you — built to last for years.

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WASHINGTON Digest

By PORTER M. HEDGE
Washington Correspondent for
The Soybean Digest

Will Goals Be Met? Even with the assurance of a grower price support of $2.04 a bushel for another year, Department of Agriculture production experts are frankly skeptical of attaining the new soybean production goal of 10,700,000 acres.

If there is a normal spring and producers have a chance to carry out their intentions, they expect soybean plantings in the neighborhood of 9 to 9½ million acres — about the original goal acreage. If the planting season is delayed by a wet spring, the expectation is for a slightly higher soybean acreage.

With the food situation tightening up in all parts of the world, the Department of Agriculture belatedly has come out with announcement of a $2.04 price support on 1946 soybeans.

This was the price support recommendation of many USDA production officials as early as last fall, assuming that an acreage of 9 million acres or more was wanted.

The same differentials from the base price for No. 2 green and yellow soybeans will apply on this year's crop.

Announcement of the method for supporting producer prices is held up pending disposition of USDA's request for an increase of $10 to $15 a ton in price ceilings on protein meals.

An upward adjustment in protein meal price ceilings, so part of the soybean subsidy can be withdrawn this year, has been under consideration in USDA and OPA for several weeks.

Should meal ceilings be raised (and this isn't now considered probable) only part of the soybean subsidy would be restored this year.

Secretary of Agriculture Anderson is asking for 1,110,000 more acres of soybeans this year than called for in the original goal of 9,590,000 acres.

Anderson's bid takes note of "the world supply of fats and oils, which is much smaller than expected, the slow movement of supplies from Pacific area sources, and the great relief needs in war-torn countries."

The following state increases (in thousands of acres) are asked:

Iowa 200, Ohio 200, Illinois 150, Indiana 150, Minnesota 100, Missouri 73, North Carolina 46, Michigan 30, Nebraska 20, Virginia 20, South Dakota 15, Kentucky 15, Kansas 15, Mississippi 15, Maryland 10, Tennessee 10, Louisiana 10, Arkansas 10, all other states 21.

Meal in Adhesives A "good prospect" for increased industrial use of soybean oil meal in the making of adhesives is noted in the annual report just issued of the Department of Agriculture's Bureau of Agricultural and Industrial Chemistry. The report states:

"Although soybean oil meal had been used for many years in making an adhesive for plywood, its use for this purpose declined during the war years because of the demand for waterproof plywood for constructing aircraft and special types of naval equipment.

"Plywood bonded with soybean glue was considered to be water-resistant but not waterproof; hence it was displaced to a large extent by plywood bonded with phenol-formaldehyde and other resins.

"The annual report for 1944 told how the Northern Regional Research Laboratory had succeeded in developing a new soybean-modified, phenol-formaldehyde adhesive for waterproof plywood, the product consisting of a solvent-extracted soybean oil meal freed of its water-soluble constituents and mixed with commercially available or freshly-prepared phenolic resin in the intermediate stage. A commercial trial had demonstrated that excellent birch and birch-basswood plywood could be fabricated with such an adhesive.

"During the past year a plywood manufacturer made practical use of this discovery and consumed half a million pounds of commercial brand of soybean oil meal, within a 12 month period in making waterproof plywood.

"Also a manufacturer of soybean oil meal offered to supply large quantities of oil meal of the proper quality to companies that might become interested in the use of the soybean-modified, phenolic-resin plywood adhesive. So there seems to be a good prospect for increased industrial utilization of soybean oil meal in adhesives."

Will Hike Exports Because of the world shortage of fats and oils, the U.S. 1946 export goal has been hiked by about 35,000 tons to 375,000 tons.

The Department of Agriculture's Office of Foreign Agricultural Relations predicts that the world fats and oils situation will remain critical throughout the current season.

The situation in a nutshell:

Total 1945-46 exportable supplies, excluding butter, run to 6.5 billion pounds, 2.5 billion pounds below pre-war years.

Total world import requirements (based on about 80 percent of pre-war consumption) are approximately 9.4 billion pounds, nearly 3 billion pounds over export supplies.

Says the Office of Foreign Agriculture:

"Total supplies will remain inadequate to fulfill requirements until production in the Far East is restored and shipments from that area again become available in volume, as this area prior to Japanese occupation

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contributed about 35 percent of the fats and oils that moved in international trade.

"Although the Far East . . . has been liberated for almost six months, exports have consisted solely of very limited quantities of copra from the Philippines. As yet Manchuria, China, Malaya, and The Netherlands have not contributed to alleviating the world shortage. Furthermore, for the first half of 1946 it is expected that shipments from these last four areas will be very small."

March Set-Aside The protein meal set-aside continues at 5 percent of production for March. Reports just released show that 29,300 tons of meal have been distributed in 27 states under government direction from Jan. 21 through Feb. 28. The states receiving meal:

Maine, Vermont, Rhode Island, Kentucky, Michigan, Maryland, Virginia, West Virginia, North Carolina, Tennessee, Alabama, Arkansas, Florida, Louisiana, Mississippi, Oklahoma, South Carolina, Texas, California, Colorado, Idaho, Kansas, Nevada, New Mexico, Oregon, Utah and Wyoming.

Shops for S. A. Fats W. H. Jasspon, head of USDA's Fats & Oils branch, has returned from a mission to Argentina where he has been shopping for Commodity Credit Corporation for purchase of oil seeds.

Even though Argentina's supply of oil seeds is short this year, Secretary of Agriculture Anderson is searching wherever possible to increase U. S. fats and oils supplies. Jasspon returned to Argentina to supervise further deals.

Drop Fat Quota The tightening squeeze on supplies of fats and oils has caused the Department of Agriculture, beginning April 1, to discontinue the emergency quota of 4 percent on fats and oils for manufacturers of shortening, salad and cooking oils.

Manufacturers' quotas will be kept at 88 percent of the base period rate of use, the same percentage in effect before the emergency quota was adopted Oct. 1, 1945.

Margarine quotas remain unchanged at 95 percent of 1944 production.

UNRRA is negotiating through the Department of Agriculture for the purchase of 100 million pounds of dry soups containing 25 to 40 percent soya for overseas relief. Bulk of the soup is intended for China.

—s b d—

ROANOKE IS NEW CAROLINA VARIETY

Roanoke is a new medium late variety of soybeans being released by the North Carolina State Experiment Station this winter.

Roanoke has a very high oil content and is adapted to North Carolina conditions, particularly to the Coastal Plains and Piedmont areas.

The variety was developed from a single plant selection made from a mixed seed lot in the fall of 1941, under the direction of J. A. Rigney, associate agronomist at the Station, and E. E. Hartwig, associate agronomist of the U. S. Regional Soybean Laboratory, also at Raleigh.

Roanoke is medium tall with medium sized stems, has grey pubescence and white flowers, and matures about October 25. The seed is yellow and medium in size. In comparison with Wood's Yellow, the predominant variety in North Carolina, Roanoke has lighter stems, is more resistant to shattering, is higher yielding, and produces seed with a much higher oil content. The seed of Roanoke is smaller (2,700 per pound) than Woods Yellow (1,800 per pound). Roanoke resembles Volstate in general plant characteristics and time of maturity but has given higher seed yields and has a higher oil content. Roanoke makes more rapid seedling growth than other varieties with the possible exception of Tokyo.

Roanoke might well replace Woods Yellow in all areas where the latter is now grown, the North Carolina Station recommends.

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3 Cultures in 1 Can for all clovers, alfalfa and soybeans.

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--- MARKET STREET ---

We invite the readers of THE SOYBEAN DIGEST to use "MARKET STREET" for their classified advertising. If you have processing machinery, laboratory equipment, soybean seed, or other items of interest to the industry, advertise them here. Rate: 5c per word per issue. Minimum insertion $1.00.

FOR SALE — Certified Lincoln and Illini soybean seed, $3.00 per bu. in bags. Certified Tama oats $1.25 per bu. Special price on large lots. J. Harold Canterbury, Cantrall, Ill.

WANTED — Anderson Super Duo expeller with fourteen inch conditioner or thirty-six inch cooker. IM, Soybean Digest, Hudson, Iowa.

CERTIFIED LINCOLN soybean seed, also Earlyana for sale. Special price in truck or carload lots. Bert L. Benskin, Laurel, Iowa.

FOR SALE — Wisconsin 606 Manchu Soybeans, also Mendota Vegetable Soybeans. 1945 production. The Andrews Bros., Platteville, Wis.

FOR SALE — Lincoln soybeans, $2.75 per bu. bin run, $2.90 cleaned and bagged. High yielding hybrid seed corn, early, medium and full season varieties. Agents wanted to sell corn. McAllister Seed Farms, Mt. Union, Iowa.

WANTED — Clipper seed cleaner. Please state size and condition. Frank Diekemper, 1104 N. Illinois St., Bellevue, Ill.

FOR SALE — 1,600 bushels certified Lincoln soybeans, Tested Feb. 26, 1946. Purity 99.7%. Germination 93%. Price $3.50 per bu. at warehouse. Charles Ackerman, Jr., Mechanicsburg, Ohio.

Seed Directory

A charge of $1.00 will be made to subscribers for listing in the April issue. Quantity for sale and variety are included.

ILLINOIS

Arcola — Geo. L. Pfeifer, 5,000 bu. certified Lincoln.

Atwood — John H. Livengood, Sr., 300 bu. certified Dunfield; 700 bu. Lincoln, certification can be completed after cleaning.

Bowen — Roy A. Morton & Sons, Lincoln, Illini, and Earlyana, all certified.

Cambridge — Hadley Farms, Rt. 2, 1,300 bu. certified Lincoln.

Cantrall — J. Harold Canterbury, 2,000 bu. certified Lincoln; 600 bu. certified Illini.

Champaign — Seeber Brothers, Rt. 3, 2,000 bu. certified Chief; 500 bu. certified Lincoln.

DeKalb — DeKalb Agricultural Association, Inc., 310 N. Fifth St., 4,500 bu. certified Earlyana; 2,400 bu. certified Lincoln.

Ladd — Martin Manning, 1,500 bu. certified Lincoln.

Laura — Hubert L. Oakes, 1,000 bu. certified Lincoln, purity 99.9%, germination 97%; 600 bu. uncertified Lincoln.

Lomax — John Peasley, 2,500 bu. certified Lincoln.

Ludlow — Ludlow Coop. Elevator Co., 3,000 bu. Lincoln, some certified; 3,000 bu. uncertified Illini.

Mattoon — Turner Seed & Supply, IC and Champaign St., 500 bu. certified Richland; 2,000 bu. uncertified Richland; 5,000 bu. certified Lincoln; 20,000 bu. uncertified Lincoln, 1,000 bu. uncertified Patoka; 4,000 bu. uncertified Mt. Carmel; 5,000 bu. uncertified Chief, Illini, Dunfield.

Nokomis — E. E. Rademacher, Box 184, 1,500 bu. certified Lincoln; 350 bu. uncertified Illinois (brown hay).

Nokomis — Ike Smith, Rt. 2, 3,000 bu. certified Lincoln.

New Berlin — Evan F. Taylor, Rt. 1, 2,000 bu. certified Lincoln.

Normal — National Hybrid Corn Co. (of Illinois), 102 E. Phoenix Ave., 2,500 bu. certified Lincoln.

Onarga — Onarga Farms, S. B. Cultra, 1,000-3,000 bu. certified Lincoln.

Ottawa — Willis Thorsen, Rt. 2, 2,100 bushels certified Lincoln, varietal purity 99.9, germination 97%.

Peoria — W. O. Pendarvis, 1007 Central Nat'l Bank Bldg., 600 bu. certified Lincoln.

Peoria — W. G. Kelly, Kelly Seed Co., 116-18 S. Wash. St., 11,000 bu. certified Lincoln; 800 bu. uncertified Lincoln; 1,500 bu. uncertified Illini; 1,500 bu. uncertified Dunfield; 1,200 bu. uncertified Chief; 2,800 bu. uncertified Richland; 800 bu. uncertified Mt. Carmel; 6,500 bu. uncertified Patoka.

Pesotum — D. W. Burnett, 3,500 bu. certified Lincoln, no germination test made yet.

Rantoul — Harold Zehr, Rt. 1, 3,000 bu. certified Illini; 500 bu. certified Lincoln.

Roadhouse — A. D. McLamar, Rt. 1, 400 bu. certified Chief.

Roseville — Pratt Seed Farms, Dale Watson, Mgr., 5,000 bu. certified Lincoln; 1,500 bu. uncertified Lincoln.

Royal — Henry Osterbur, Jr., 1,400-1,500 bu. certified Lincoln, germination 96%, purity 99.5%.

Savoy — R. J. Hixson, P.O. Box 26, 1,500 bu. Lincoln grown from own certified seed, will furnish certification if wanted.

Seymour — Paul V. Klein, Rt. 1, 3,000 bu. certified Lincoln.

Sidney — S. A. Buddemeier, Rt. 1, 1,000 bu. certified Lincoln.

Springfield — R. C. Graham, 308 Ferguson Bldg., 1,500 bu. certified Lincoln, in 2-bu. bags.

Stonington — James Meridith, 1,500 bu. certified Lincoln.

Sullivan — Landers Seed Co., 1,500 bu. certified Lincoln; 1,500 bu. uncertified Lincoln; could also supply several thousand bu. uncertified Lincoln from certified stock in hands of farmers in community.

Taylorville — Debrun Bros., 400 N. Main St., 1,400 bu. certified Lincoln.

Tolono — W. E. Riegel, 1,000 bu. Lincoln grown from 1945 certified seed.

Tuscola — A. N. Cabalek, 800 bu. certified Illini; 1,400 bu. certified Tama; 300 bu. certified Lincoln.

Utica — R. W. Jones, Rt. 1, 1,500 bu. certified Lincoln.

Witt — Witt Elevator, 3,000 bu. certified Lincoln; 3,000 bu. uncertified Illini; 3,000 bu. uncertified Chief; 2,000 bu. uncertified Dunfield; 1,500 bu. uncertified Virginia.

INDIANA

Amboy — Glen D. Pence & Son, Rt. 1, 2,000 bu. certified Lincoln.

Berne — Earl Sipe, Rt. 2, 200 bu. certified Lincoln.

Bluffton — Herman L. Miller, Rt. 1, 1,400 bu. certified Lincoln, purity 99.9%; 600 bu. certified Richland, purity 99.9%.

Brookville — George A. Prifogle, 1,000 bu. certified Lincoln, foundation seed stock, germination 95%.

Camden — Taylor Fouts, Soyland, St. RDS. No. 29 and 218, 1,500 bu. certified Lincoln; 1,500 bu. certified Tama oats.

Ft. Wayne — O. L. Bryant & Son, Rt. 4, 4,000 bu. certified Lincoln; 800 bu. certified Earlyana.

Greenfield — Lewis C. Hardin, Rt. 1, 2,000 bu. certified Lincoln.

Huntington — D. E. Whinery, Rt. 6, 800 bu. Indiana certified Lincoln.

Huntington — Allan Anson, Rt. 2, 1,500 bu. certified Lincoln.

Kouts — Walter Heiniger, 1,200 bu. certified Lincoln.

Lafayette — Agricultural Alumni Seed Improvement Association, Inc., Rt. 1, 2,000 bu. certified Lincoln, foundation seed.

McCordsville — Maurice Woodward, 1,500 bu. certified Lincoln.

Muncie — O. C. Russell & Sons, Rt. 1, 1,000 bu. certified Lincoln, foundation seed; 500 bu. certified Kingwa foundation seed.

Princeton — Princeton Farms, 1,000 bu. certified Lincoln; 2,000 bu. certified Gibson; 2,000 bu. certified Patoka.

Remington — Edward F. Lehman, certified Lincoln foundation stock.

Remington — Chester B. Biddle, 10,000 bu. certified Lincoln.

Remington — Glenn L. Kinsell, 5,000 bu. certified Lincoln; 3,000 bu. certified Earlyana; 500 bu. certified Richland.

Valparaiso — L. K. Wyckoff, Rt. 3, 2,500 bu. certified Lincoln; 1,200 bu. certified Lincoln foundation; 2,500 bu. certified Earlyana; 1,000 bu. certified Earlyana foundation; 500 bu. certified Richland.

Walton — Lloyd W. Toney, Rt. 2, 500 bu. certified Lincoln; 200 bu. certified Earlyana.

Waveland — Harry N. Moser, 1,000 bu. certified Lincoln; 400 bu. certified Earlyana.

Windfall — Mitchell Farms, 2,000 bu. certified Earlyana; 4,000 bu. certified Lincoln.

IOWA

Batavia — Maurice Laughlin, 500 bu. certified Lincoln.

Batavia — Glenn Willhoit, 500 bu. certified Lincoln 95% germination.

Boone — Lloyd F. Nelson, Rt. 2, 300 bu. certified Lincoln.

Boone — Roscoe Marsden, Rt. 1, 1,000 bu. certified Lincoln.

Castana — Fred W. Hawthorn, 2,000 bu. certified Lincoln.

Center Point — Elmer F. Burr, 2,000 bu. certified Lincoln.

Crawfordsville — Richard Stephens, 600 bu. certified Lincoln.

Des Moines — A. B. Kline, 3122 49th St., 1,200 bu. certified Lincoln.

Dysart — Henry Hilmer, 3,000 bu. certified Lincoln.

Estherville — A. B. Rosenberger, 250 bu. certified Earlyana; 200 bu. Richland from certified seed; 150 bu. uncertified Habaro.

Harlan — Kilpatrick Hybrid Corn Co., Rt. 2, 285 bu. certified Lincoln.

Hudson — Strayer Seed Farms, 1,000 bu. certified Lincoln; 700 bu. uncertified Bansei; 400 bu. uncertified Giant Green; 200 bu. uncertified Sac.

Independence — T. J. Searcy, 500 bu. certified Lincoln.

Laurel — Bert L. Benskin, certified Lincoln, Earlyana.

Marcus — John Sand, 400 bu. certified Lincoln; 3,000 bu. certified Earlyana; 1,000 bu. certified Richland.

Marshalltown — Clarence R. Zink, Rt. 5, 700 bu. certified Lincoln.

Marshalltown — Kenneth R. Lynk, Route 1, 4,500 bu. certified Lincoln; 350 bu. Richland from certified seed.

New Sharon — Eddie De Jong, Rt. 1, 200 bu. certified Lincoln.

Packwood — Carl Edmund, 2,000 bu. certified Lincoln.

Pilot Mound — W. W. Lundberg, 200 bu. certified Lincoln.

Richland — Alva Leo Baker, Rt. 1, 900 bu. certified Lincoln.

Templeton — Irlbeck Hybrid Seed Farm, 400 bu. certified Lincoln.

Tipton — Edwin Butterbrodt, 1,500 bu. certified Lincoln; recleaned and bagged.

Traer — Roy Kern, Lincoln, Earlyana and Richland, certified or uncertified; Tama, Boone and Vickland oats.

Tripoli — R. O. Wikner, Towneview Farm, certified Earlyana, germination 97%; Tama oats grown from certified seed.

Union — Merle Stanfield, 2,000 bu. certified Lincoln.

Wall Lake — A. J. Graham, 1,500 bu. certified Lincoln.

Williams — Lawrence J. Reike, 2,500 bu. certified Lincoln.

Winfield — Harry Rossiter, 500 bu. certified Lincoln, germination 96%

MINNESOTA

Hector — Kenneth C. Butler, 200 bu. certified Wisconsin Mandarin; 100 bu. certified Ottawa Mandarin.

Cannon Falls — Geo. F. Schwartaw, 500 bu. registered Habaro.

Montevideo — John W. Evans, Rt. 1, 400 bu. Habaro; 200 bu. Pridesoy; 400 bu. certified Ottawa Mandarin.

OHIO

Bucyrus — Earl G. Lowmiller, Rt. 3, certified Earlyana; uncertified Lincoln; certified Vicland oats.

Lima — The Ackerman Co., 215 W. First St., 600 bu. certified Lincoln; 500 bu. uncertified Lincoln; 1,000 bu. uncertified Kingwa.

Maumee — W. N. Woods & Son, Monclova Road, 250 bu. Earlyana; 600 bu. Lincoln.

Maumee — H. P. Schaller & Sons, Rt. 1, 1,500 bu. certified Lincoln; 600 bu. uncertified Lincoln.

Van Wert — Marsh Foundation Farms, Box 150, 5,000 bu. Ohio certified Lincoln; 5,000 bu. uncertified Lincoln.

In The MARKETS

● STOCKS OF SOYBEANS. Stocks of 154 million bushels of soybeans were stored in all positions, on and off farms, on January 1, 1946, according to information compiled by the Department of Agriculture. Making up this total were more than 43 million bushels on farms and nearly 40 million bushels stored in interior mills, elevators, warehouses and other establishments, as estimated by the Crop Reporting Board; more than 46 million bushels held in processing plants, as enumerated by the Bureau of the Census; about 24½ million bushels reported as commercial stocks at terminals by the Production and Marketing Administration; and nearly ½ million bushels reported by Commodity Credit Corporation in its own steel and wooden bins. Stocks in these positions on January 1, 1945, totaled about 157½ million bushels.

From the estimated supply of 199½ million bushels (stocks of 7.7 million plus production of 191.7 million bushels) of soybeans as of October 1, 1945, disappearance to January 1, 1946 is indicated at 45½ million bushels. Of this, 37,812,000 bushels were processed for oil in the final quarter of 1945, according to reports of the Bureau of the Census. In the same period of 1944, disappearance was about 47 million bushels, of which crushings accounted for 31,853,000 bushels. If the stepped-up rate of crushing indicated in the last quarter of 1945 were to be continued into 1946 it appears that the supply would be exhausted well before the new crop becomes available, after making allowances for seed requirements, for usual quantities fed on farms and used for human consumption, and for smaller exports than last season.

Stocks of Soybeans, January 1, 1946, with Comparisons (1,000 Bu)

Position	Jan. 1 1945	Oct. 1 1945	Jan. 1 1946
On Farms	41,998	2,931	43,363
Int. M. E. & Warehouses*	40,137	447	39,529
Processing Plants	47,429	3,547	46,255
Terminal Markets	24,446	815	24,423
Steel & Wooden Bins	3,523	0	400
Total All Positions	157,533	7,740	153,970

Stocks* of Soybeans in Interior Mills, Elevators, and Warehouses, January 1, 1946, by States, with Comparisons (1,000 Bu.)

State	Jan. 1 1945	Oct. 1 1945	Jan. 1 1946
Ohio	3,644	18	2,744
Indiana	4,559	71	4,538
Illinois	18,222	105	18,806
Michigan	112	4	191
Minnesota	334	43	650
Iowa	11,833	99	11,070
Missouri	601	12	645
Nebraska	68	0	14
Kansas	149	4	219
Virginia	13	1	35
North Carolina	128	1	83
Mississippi	40	1	46
Arkansas	41	0	43
Other States	393	88	445
United States	40,137	447	39,529

* Includes only stocks in interior mills, elevators, warehouses and other establishments as estimated by the Crop Reporting Board.

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● SOYBEAN INSPECTIONS. Inspected receipts of soybeans in January were nearly 20 percent over December, with considerable improvement in quality, according to inspectors' reports to the Grain Branch of the Production and Marketing Administration.

January inspections totaled 4,153 cars compared with 3,464 cars in December. Inspected receipts for the first four months this season were 61,888 cars compared with 55,785 cars for the same period 1944-45.

The quality of soybeans inspected in January showed considerable improvement over December. Eighty-eight percent of the January inspections graded No. 2 or better compared with 77 percent a month earlier. Only 12 percent fell in the lower grades compared with 23 percent the preceding month.

January inspections included the equivalent of 91 cars inspected as cargo lots and truck receipts equivalent to about 42 cars.

● SOYBEAN STOCKS. Production and Marketing Administration's commercial grain stock report.

U. S. Soybeans in Store and Afloat at Domestic Markets (1,000 Bu.)

	Feb. 5	Feb. 12	Feb. 19	Feb. 26
Atlantic Coast	117	117	117	117
Gulf Coast	3	3	3	130
Northwestern and Upper Lake	2,074	2,046	1,811	2,006
Lower Lake	9,382	8,790	8,432	7,915
East Central	5,691	5,325	4,918	4,587
West Central Southwestern & Western	3,099	2,936	2,694	2,500
Pacific Coast				
Total current week	20,366	19,217	17,975	17,255
Total prev. week (rev.)	21,269	20,367	19,155	18,167
Total Year ago	21,651	20,792	20,312	19,967
Total North American Commercial Soybean Stocks				
Current week	20,366	19,217	17,975	17,255
Previous week (revised)	21,269	20,367	19,155	18,167
Year ago	21,725	20,863	20,380	20,014

● STANDARD SHORTENING SHIPMENTS. By Members of Institute of Shortening Mfgrs., in pounds.

February 9	7,754,102
February 16	7,448,070
February 23	7,118,338
March 2	6,291,625

Government Orders

● SUPPORT PRICE ON 1946 CROP. The U. S. Department of Agriculture has announced that because of the tight situation on protein meals and edible and industrial oils, the 1946 grower support price on soybeans will be the same as for 1945. This action is being taken to assist farmers in meeting the 1946 goals for this crop.

Base support price for the 1946 crop green and yellow soybeans grading U. S. No. 2 will be $2.04 per bushel. The same differentials specified under the 1945 program will be made for other colors of beans, and for variations in quality. The method of supporting prices to producers will be announced later.

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